Universal PCI Board User's Manual

Multiport Serial Board for PCI and PCI-X Bus

Seventh Edition, October 2009

www.moxa.com/product

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Universal PCI Board User's Manual

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1
Introduction

The following topics are covered in this chapter:

- **Overview**
  - Applications
- **Package Checklist**
- **Product Features**
- **Product Specifications**
- **Installation Guide**

Overview

Moxa Universal PCI (UPCI) multiport serial boards can be installed in PCI or PCI-X slots, and support both 3.3V and 5V PCI/PCI-X. With a UPCI board, you can connect data acquisition equipment and other serial devices to your PC over RS-232, RS-422, or RS-485. Each board has on-chip hardware and software flow control, a built-in 128-byte Tx/Rx FIFO, and well-designed device drivers that have been fine-tuned. This allows Moxa UPCI boards to support data transmission speeds of up to 921.6 Kbps.

The following UPCI multiport serial boards are available from Moxa:

8 Ports

CP-118U:	8 ports, RS-232/422/485
CP-118U-T:	8 ports, RS-232/422/485, wide temperature
CP-118U-I:	8 ports, RS-232/422/485, 2KV optical isolation
CP-118-U-I-T:	8 ports, RS-232/422/485, 2KV optical isolation, wide temperature
CP-138U:	8 ports, RS-422/485
CP-138-T:	8 ports, RS-422/485, wide temperature
CP-138-I:	8 ports, RS-422/485, 2KV optical isolation, wide temperature
CP-138-U-T-I:	8 ports, RS-422/485, 2KV optical isolation
CP-168U:	8 ports, RS-232
CP-168U-T:	8 ports, RS-232, wide temperature

4 Ports

CP-114UL:	4 ports, RS-232/422/485, low profile
CP-114UL-T:	4 ports, RS-232/422/485, low profile, wide temperature
CP-114UL-I:	4 ports, RS-232/422/485, low profile, 2KV optical isolation
CP-114UL-I-T:	4 ports, RS-232/422/485, low profile, , 2KV optical isolation, wide temperature
CP-134U:	4 ports, RS-422/485
CP-134U-T:	4 ports, RS-422/485, wide temperature
CP-134U-I:	4 ports, RS-422/485, 2KV optical isolation
CP-134U-I-T:	4 ports, RS-422/485, 2KV optical isolation, wide temperature
CP-104UL:	4 ports, RS-232, low profile
CP-104UL-T:	4 ports, RS-232, low profile, wide temperature
CP-104JU:	4 ports, RS-232, 8-pin RJ45 connector on-board
CP-104JU-T:	4 ports, RS-232, 8-pin RJ45 connector on-board, wide temperature
POS-104UL:	4 ports, RS-232, low profile, serial port powered
POS-104UL-T:	4 ports, RS-232, low profile, serial port powered, wide temperature

2 Ports

CP-112UL:	2 ports, RS-232/422/485, low profile
CP-112UL-T:	2 ports, RS-232/422/485, low profile, wide temperature
CP-112UL-I:	2 ports, RS-232/422/485, low profile, 2KV optical isolation
CP-112UL-I-T:	2 ports, RS-232/422/485, low profile, 2KV optical isolation
CP-132UL:	2 ports, RS-422/485, low profile
CP-132UL-T:	2 ports, RS-422/485, low profile, wide temperature
CP-132UL-I:	2 ports, RS-422/485, low profile, 2KV optical isolation
CP-132UL-I-T:	2 ports, RS-422/485, low profile, 2KV optical isolation, wide temperature
CP-102UL:	2 ports, RS-232, low profile
CP-102UL-T:	2 ports, RS-232, low profile, wide temperature
CP-102U:	2 ports, RS-232
CP-102U-T:	2 ports, RS-232, wide temperature
CP-102UF:	2 ports, Serial-over-fiber board

Smartio—The Smart Multiport Async Solution

The Smartio Series of multiport serial boards includes the CP-168U, CP-104UL, CP-104JU, POS-104UL, CP-102UL, and CP-102U. These boards provide RS-232 serial ports for connecting terminals, modems, printers, scanners, cash registers, bar code readers, keypads, numeric displays, electrical scales, data acquisition equipment, and many other serial devices to a PC. These boards are a reliable, high-performance solution for multiport serial communication.

Industio—The Industrial Multiport Async Solution

The Industio Series of multiport serial boards includes the CP-118U-I, CP-118U, CP-138U-I, CP-138U, CP-114UL, CP134U, CP-134U-I, CP-132UL, and CP-132UL-I. These boards are designed for industrial use, with serial ports that can be configured independently for RS-232, RS-422, or RS-485 operation. Industio boards provide a reliable communication link over distances of up to 4000 ft and support point-to-point full-duplex or multi-drop half-duplex. With RS-485 operation, a single port can connect to 32 devices in a multi-drop environment.

ADDC™ (Automatic Data Direction Control) for RS-485

ADDC™ (Automatic Data Direction Control) makes it easier to manage 2-wire RS-485 half-duplex connections, eliminating the need for software interference. This means that it is not necessary to write extra code for Windows applications to control the half-duplex protocol. ADDC intelligence is built into Industio boards.

Serial-over-fiber Board

The CP-102UF is a serial-over-fiber board designed for industrial automation applications that require a long distance, multi-point, PC-based data acquisition solution. The single-mode model (CP-102UF-S) can transmit up to 40 km, and the multi-mode model (CP-102UF-M) can transmit up to 5 km. For many industrial applications, an even bigger benefit is that optical fiber isolates the data from dangerous increases in ground potential, ground loops, and electrical EMI/RFI electromagnetic radiation.

Built-in Termination Resistors for RS-422 and RS-485

Industio boards have termination resistors built-in, eliminating the headaches involved in determining the proper impedance for the resistors. For additional information, please refer to Chapter 2.

ESD and Isolation Protection

Certain models include TVSS (Transient Voltage Surge Suppressor) technology to help prevent damage due to lightning or high potential voltage. Optical isolation (2000V) and embedded protection (max. ESD of 16 KV, max. EFT of 2 KV) are also available with certain models. These features help provide protection in critical or harsh factory-type environments.

PCI Solution

UPCI boards comply with PCI Spec. 2.1 and do not require switches or jumpers. IRQ and I/O address is automatically assigned by the PCI BIOS. This means that the board must be physically installed in the computer first before the driver software is installed.

Universal PCI

For maximum compatibility with the PCI local bus specification, UPCI boards support both 3.3V and 5V PCI connector types. The 32/64-bit PCI local bus specification specifies both a 3.3V/5V and 32/64-bit slot.

Operating System Support

Moxa UPCI boards are compatible with most major industrial platforms, including Windows, DOS, and Linux. Drivers are provided for smoother installation, configuration, and performance. This manual provides separate sections for the different operating systems that are supported.

Moxa Serial Communication Tools

For application development, Moxa provides a serial communication library for Windows called PComm. This library can help you develop your own applications in Visual Basic, Visual C++, Borland Delphi, and more. Utilities are included for debugging, monitoring communication status, terminal emulation, and file transfer.

Applications

UPCI boards are suitable for many industrial applications, including the following:

- Multipoint data acquisition
- Factory automation
- Critical industrial control
- Remote serial device control
- Internet/intranet connections
- Remote access applications
- Multi-user applications
- Industrial automation
- Office automation
- Telecommunications
- PC-based vending machines or kiosk systems
- POS (Point-of-Sale) systems

Package Checklist

UPCI boards are shipped with the following items:

- 1 Moxa UPCI multiport serial board
- Low profile bracket (low profile models only)
- Document & Software CD
- Quick Installation Guide
- 5-year Product Warranty statement

NOTE: Notify your sales representative if any of the above items is missing or damaged. For information on optional accessories for each model, please refer to Chapter 5.

Product Features

Moxa UPCI boards enjoy the following features:

- Over 700 Kbps data throughput for top performance
- Serial communication speed up to 921.6 Kbps
- 128-byte FIFO and on-chip hardware and software flow control
- Universal PCI supporting 3.3V PCI, 5V PCI and PCI-X
- Driver support for Windows, Windows CE, Windows XP Embedded, DOS, Linux, FreeBSD, QNX SCO OpenServer, UnixWare7
- On-board 15 KV ESD protection
- Low profile for compact-sized PCs (on "L" models only)
- 2 KV optical isolation protection (on "I" models only)
- -40 to 85°C wide temperature (on "T" models only)

Product Specifications

Hardware

I/O Controller:	MU860 (compatible with 16C550C)	
Connector Type:	CP-118U-I:	Female DB78
	CP-118U:	Female DB62
	CP-138U-I:	Female DB78
	CP-138U:	Female DB62
	CP-168U :	Female DB62
	CP-114UL/ CP-114UL-I:	Female DB44
	CP-134U/CP-134U-I :	Female DB44
	CP-104UL :	Female DB44
	CP-104JU :	8-pin RJ45
	POS-104UL:	Female DB44
	CP-112UL/CP-112UL-I:	Female DB25
	CP-132UL/CP-112UL-I:	Female DB25
	CP-102UL:	Female DB25
	CP-102U:	Male DB9
	CP-114UL:	Female DB44
	CP-134U :	Female DB44
	CP-134U-I :	Female DB44
	CP-132UL :	Female DB25
	CP-132UL-I :	Female DB25
	CP-102UF:	ST type

Interface

Bus:	32-bit Universal PCI

No. of Ports:	**8 Ports:**
	CP-118U/CP-118U-I
	CP-138U/CP-138U-I
	CP-1168U
	4 Ports:
	CP-114UL/CP-114UL-I
	CP-134U/CP-134U-I
	CP-104UL/CP-104JU
	POS-104UL:
	2 Ports:
	CP-112UL/CP-112UL-I
	CP-132UL/CP-132UL-I
	CP-102UL
	CP-102U/CP-102UF
Max. No. of Boards:	4
Signals	
RS-232:	TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422:	TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
4-wire RS-485:	TxD+(B), TxD-(A), RxD+(B), RxD-(A), GND
2-wire RS-485:	Data+(B), Data-(A), GND
Performance	
Baudrate:	50 bps to 921.6 Kbps
Configuration	
Parity:	None, Even, Odd, Space, Mark
Data Bits:	5, 6, 7, 8
Stop Bits:	1, 1.5, 2
I/O Address, IRQ:	Assigned by BIOS
FIFO:	128 bytes
Flow Control:	RTS/CTS, XON/XOFF

Driver Support:	Windows 2000
	Windows XP/2003/Vista/2008 (x86 & x64)
	Linux 2.4
	Linux 2.6 (x86 & x64)
	Complete driver support information is available at www.moxa.com in the Download center.
Power Output:	5V/12V (POS-104UL only)
Power and Environment	
Operating Temperature:	0 to 55°C (32 to 131°F)
Operating Humidity:	5 to 95% RH
Storage Temperature:	-40 to 85°C (-40 to 185°F)
Protection:	Embedded 15 KV ESD protection
Certifications	
Approved:	EN55022 Class B, EN55024, EN61000-3-2, EN61000-3-3, IEC61000-4-2, IEC61000-4-3, IEC61000-4-4, IEC61000-4-5, IEC61000-4-6, IEC61000-4-8, IEC61000-4-11, FCC Part 15 Class B
Warranty	5 years

Installation Guide

UPCI board installation can be divided into six steps as follows:

Step 1: Select serial transmission mode.

For certain models, you will need to set onboard DIP switches to select the serial transmission mode for each port. This applies to the CP-118U-I, CP-138U-I, CP-118U, CP-138U, CP-114UL, CP-114UL-I, CP-134U, CP-134U-I, CP-112UL, CP-112UL-I, CP-132UL, CP-132UL-I, POS-104UL, and CP-102UF. For details, please refer to Chapter 2.

Step 2: Install board.

UPCI boards are installed in an open PCI or PCI-X expansion slot on the PC. For details, please refer to Chapter 2.

Step 3: Install drivers and configure board

For details, please refer to Chapters 3 through 8.

Step 4: Connect your serial devices to the board's serial ports

For details, please refer to Chapter 10.

Step 5: Restart system and verify driver initialization

For details, please refer to Chapters 3 through 8.

Step 6: Develop and run your serial communication application

For details, please refer to Chapter 9.

2
Hardware Installation

The following topics are covered in this chapter:

- **Overview**
- **Configuring the Board and Dimension**
  - CP-118U/CP-118U-I
  - CP-138U/CP-138U-I
  - CP-168U
  - CP-114UL/CP-114UL-I
  - CP-134U/CP-134U-I
  - CP-104UL
  - CP-104JU
  - POS-104UL
  - CP-112UL/CP-112UL-I
  - CP-132UL/CP-132UL-I
  - CP-102UL
  - CP-102U
  - CP-102UF
- **Plugging the Board into an Expansion Slot**

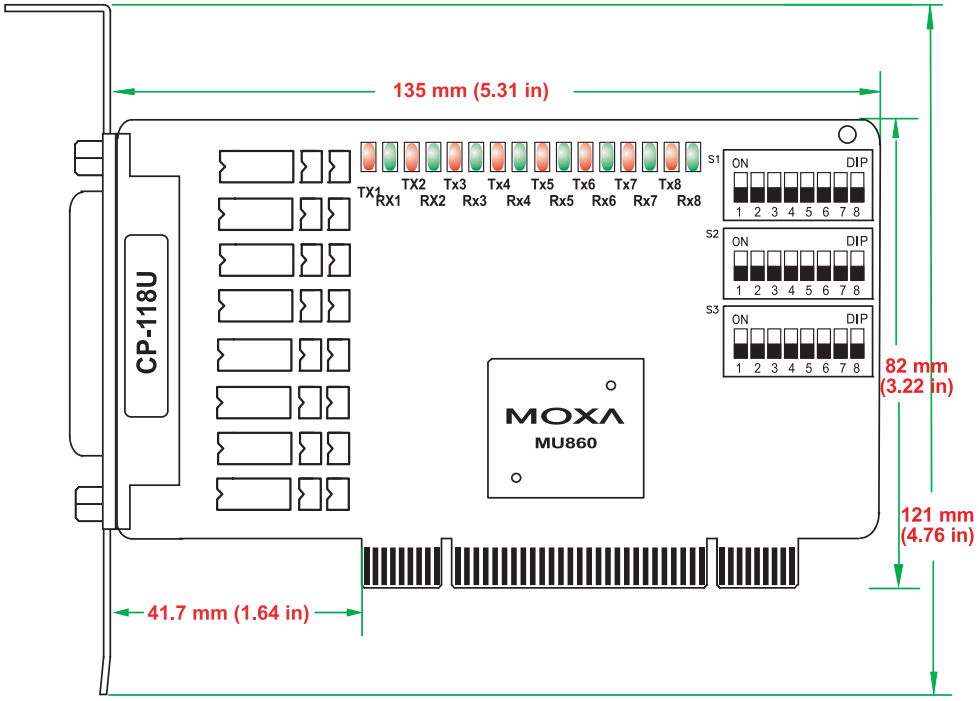
Overview

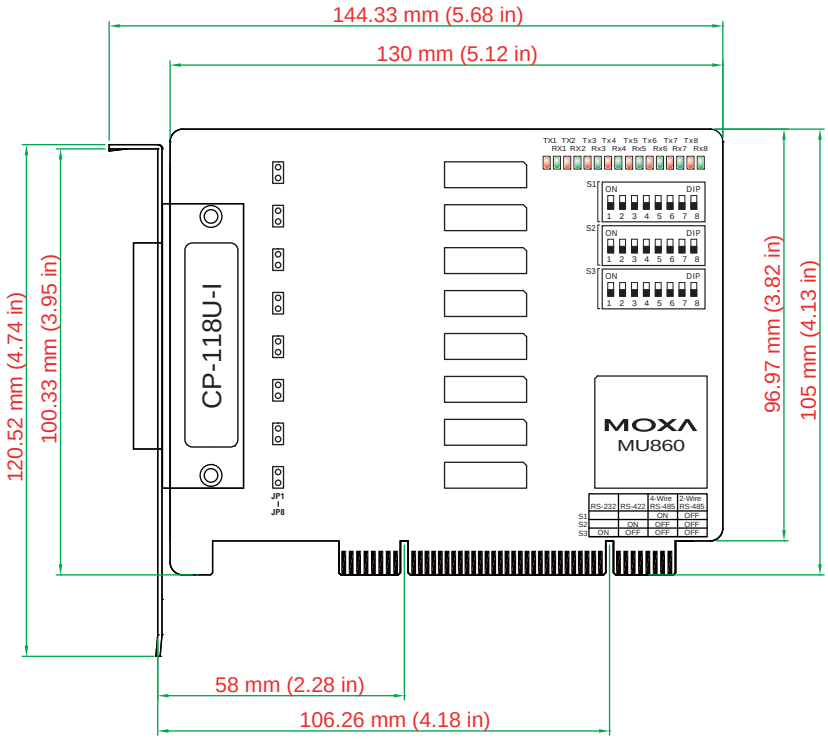
This chapter explains the hardware installation procedure in detail. Since the BIOS automatically assigns the IRQ number and I/O addresses, you will need to install the board before you install the drivers. You can install up to 4 UPCI boards in one system, as long as sufficient I/O address and IRQ number resources are available.

Configuring the Board and Dimension

8 Ports

CP-118U/CP-118U-I



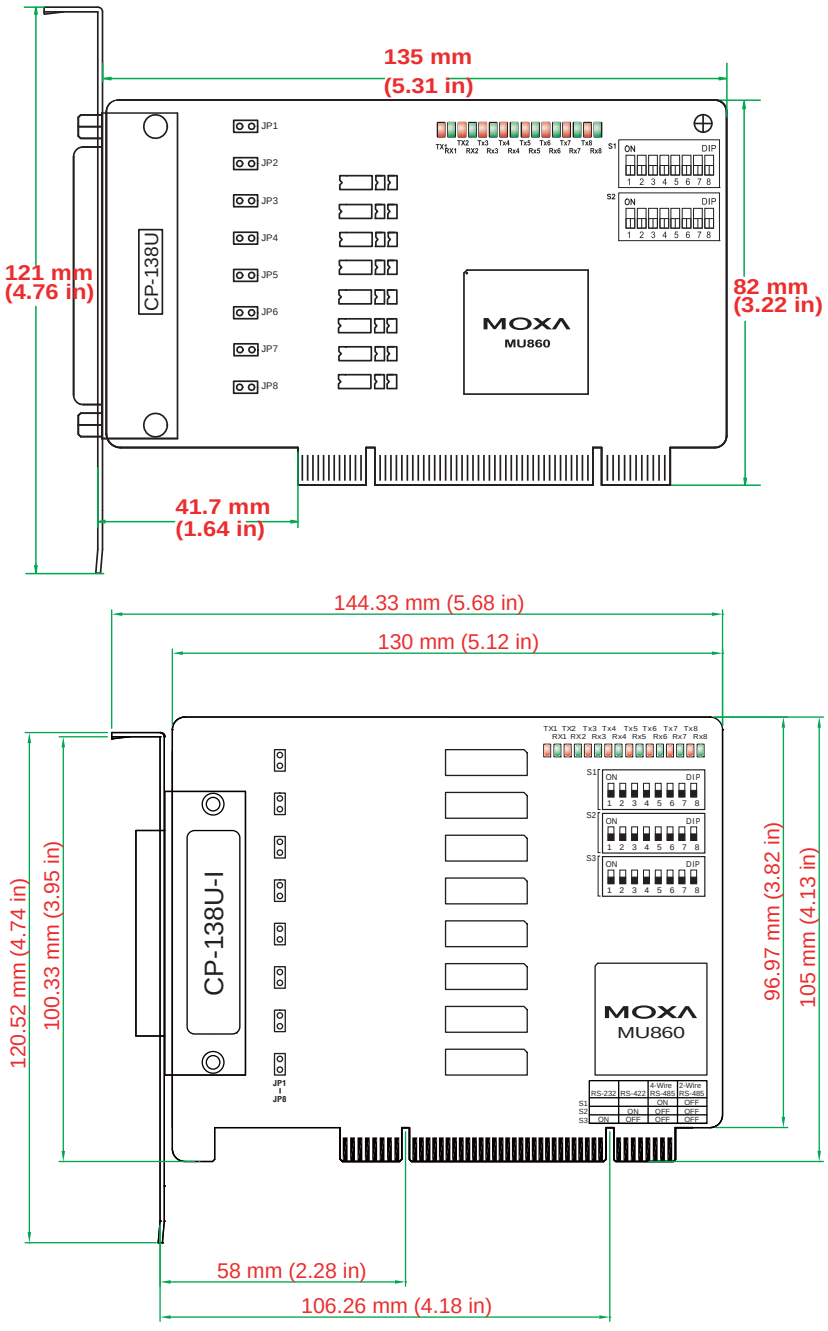


Onboard termination resistors can be activated individually for each serial port using jumpers JP1 through JP8. JP1 corresponds to serial port 1. Short the jumper pins to activate the termination resistor; leave the jumper pins open to bypass the termination resistor.

The onboard DIP switches, S1, S2, and S3, are used to select RS-232, RS-422, or RS-485 mode for each serial port. There are 8 switches on each bank corresponding to the 8 serial ports. S3 selects between RS-232 and RS-422/485, S2 selects between RS-422 and RS-485, and S1 selects between 2-wire and 4-wire RS-485, as follows:

Mode	**S1**	**S2**	**S3**
RS-232	---	---	ON
RS-422	---	ON	OFF
4-wire RS-485	ON	OFF	OFF
2-wire RS-485	OFF	OFF	OFF

CP-138U/CP-138U-I

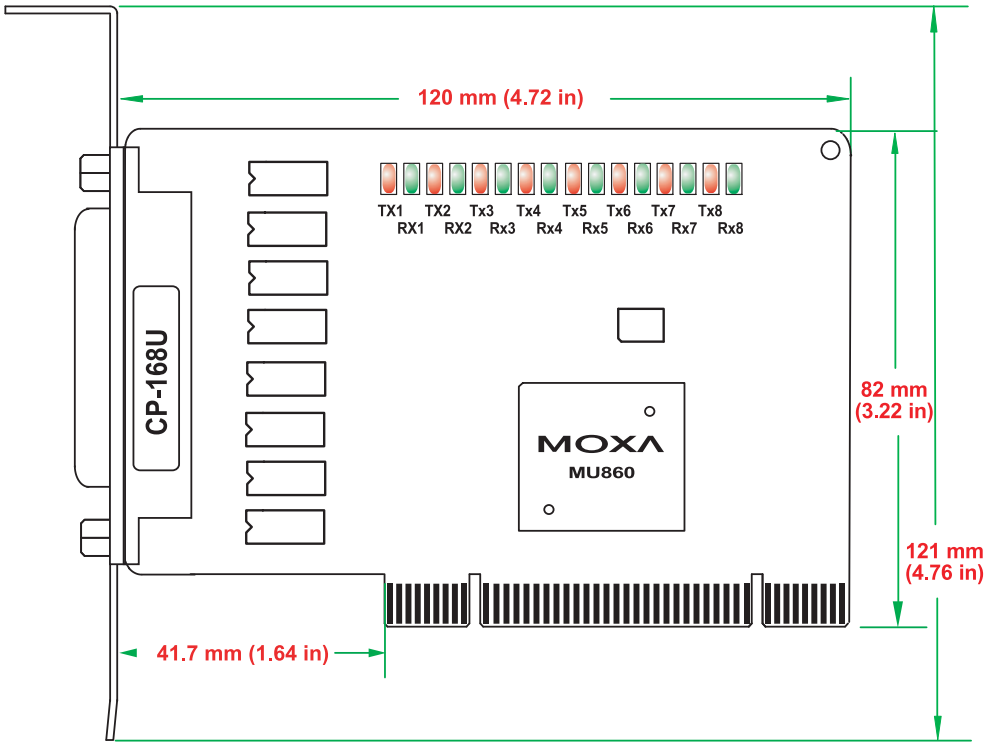


Onboard termination resistors can be activated individually for each serial port using jumpers JP1 through JP8. JP1 corresponds to serial port 1. Short the jumper pins to activate the termination resistor; leave the jumper pins open to bypass the termination resistor.

The onboard DIP switches, S1 and S2, are used to select RS-422 or RS-485 mode for each serial port. There are 8 switches on each bank corresponding to the 8 serial ports. S2 selects between RS-422 and RS-485; S1 selects between 2-wire and 4-wire RS-485, as follows:

Mode	S1	S2
RS-422	---	ON
4-wire RS-485	ON	OFF
2-wire RS-485	OFF	OFF

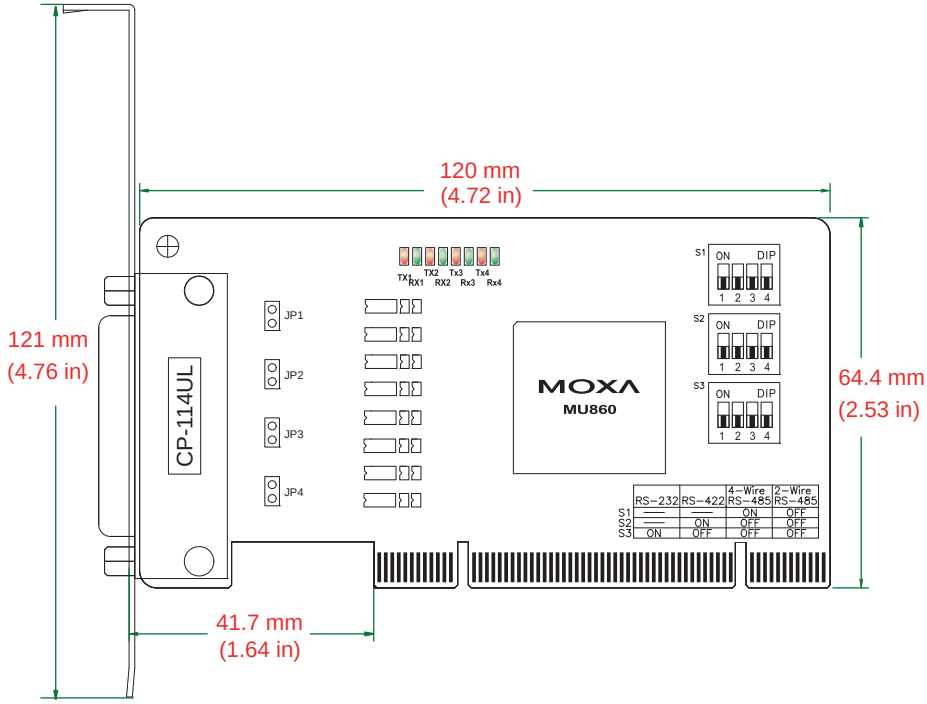
CP-168U

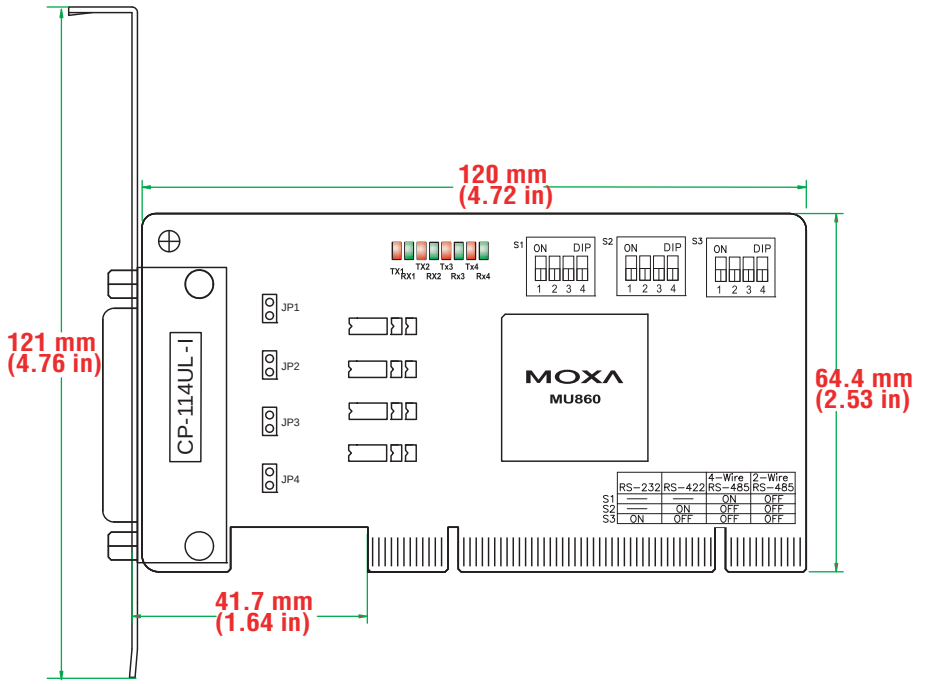


This board does not require configuration.

4 Ports

CP-114UL/CP-114UL-I



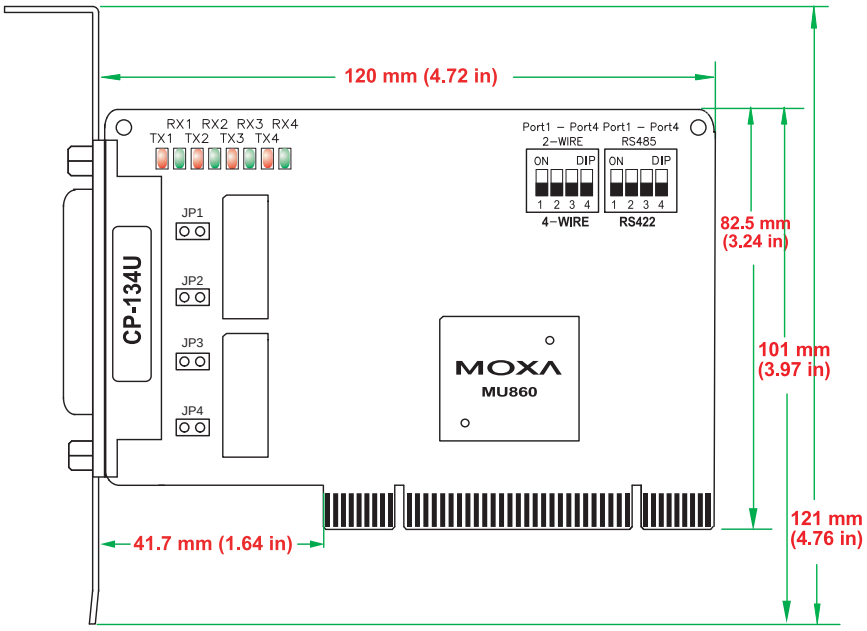


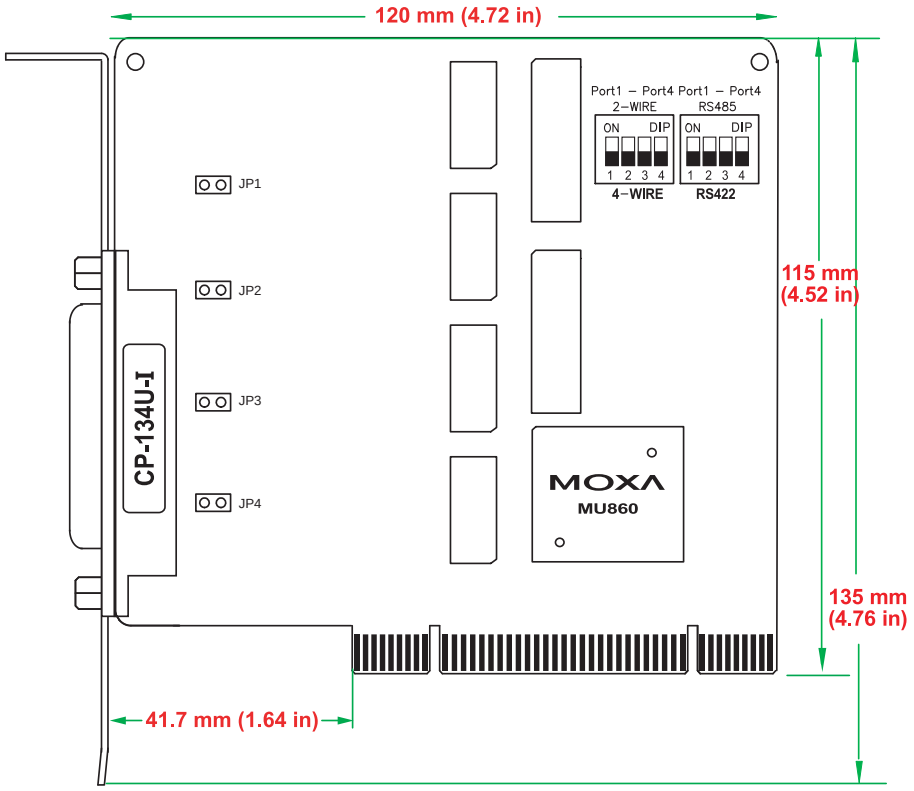
Onboard termination resistors can be activated individually for each serial port using jumpers JP1 through JP4. JP1 corresponds to serial port 1. Short the jumper pins to activate the termination resistor; leave the jumper pins open to bypass the termination resistor.

The onboard DIP switches, S1, S2, and S3, are used to select RS-232, RS-422, or RS-485 mode for each serial port. Switches 1 through 4 on each bank correspond to the 4 serial ports. S3 selects between RS-232 and RS-422/485, S2 selects between RS-422 and RS-485, and S1 selects between 2-wire and 4-wire RS-485, as follows:

Mode	S1	S2	S3
RS-232	---	---	ON
RS-422	---	ON	OFF
4-wire RS-485	ON	OFF	OFF
2-wire RS-485	OFF	OFF	OFF

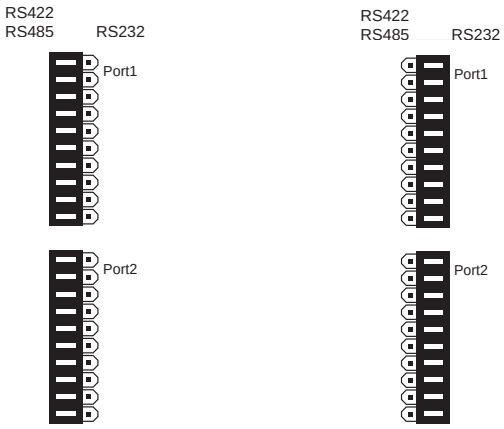
CP-134U/CP-134U-I





Onboard termination resistors can be activated individually for each serial port using jumpers JP1 through JP4. JP1 corresponds to serial port 1. Short the jumper pins to activate the termination resistor; leave the jumper pins open to bypass the termination resistor.

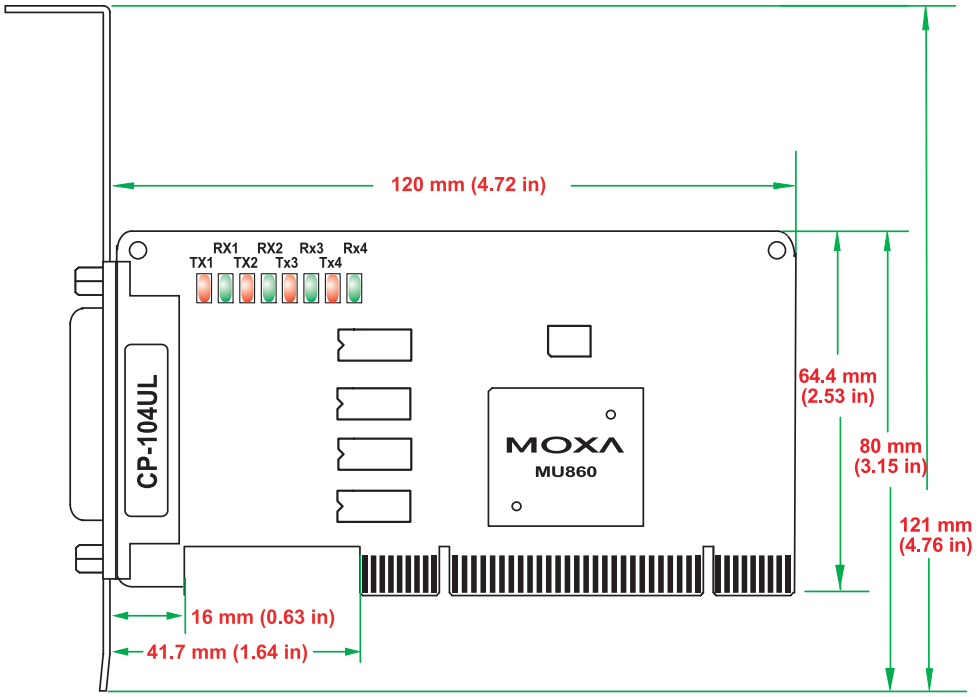
The onboard DIP switches, S1 and S2, are used to select RS-422 or RS-485 mode for each serial port. Switches 1 through 4 on each bank correspond to the 4 serial ports. S2 selects between RS-422 and RS-485; S1 selects between 2-wire and 4-wire RS-485. In addition, ports 1 and 2 can be set individually to RS-232 mode using the on-board 30-pin jumpers, as follows:



RS-422 or RS-485 mode:
Use the jumper to cover the left two columns of jumper pins.

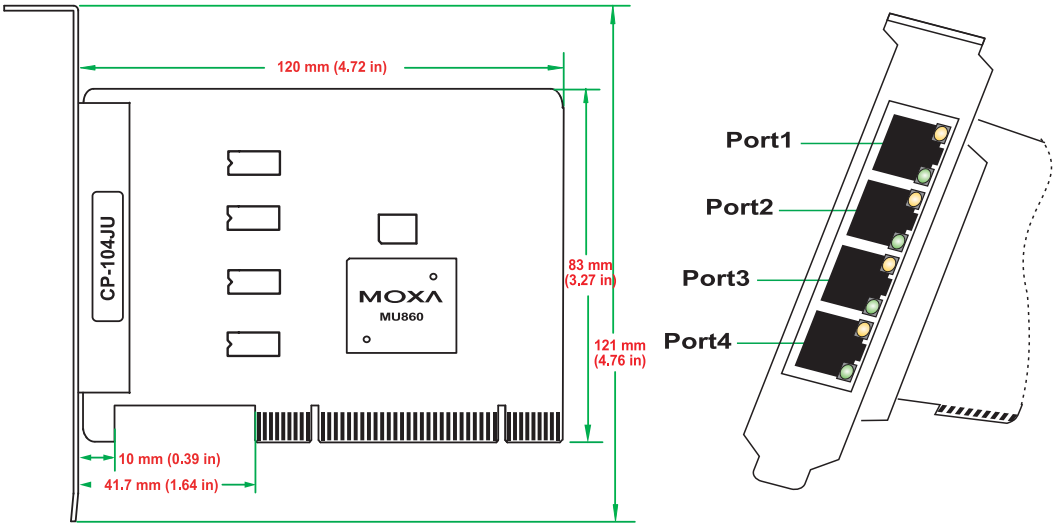
RS-232 mode:
Use the jumper to cover the right two columns of jumper pins.

CP-104UL



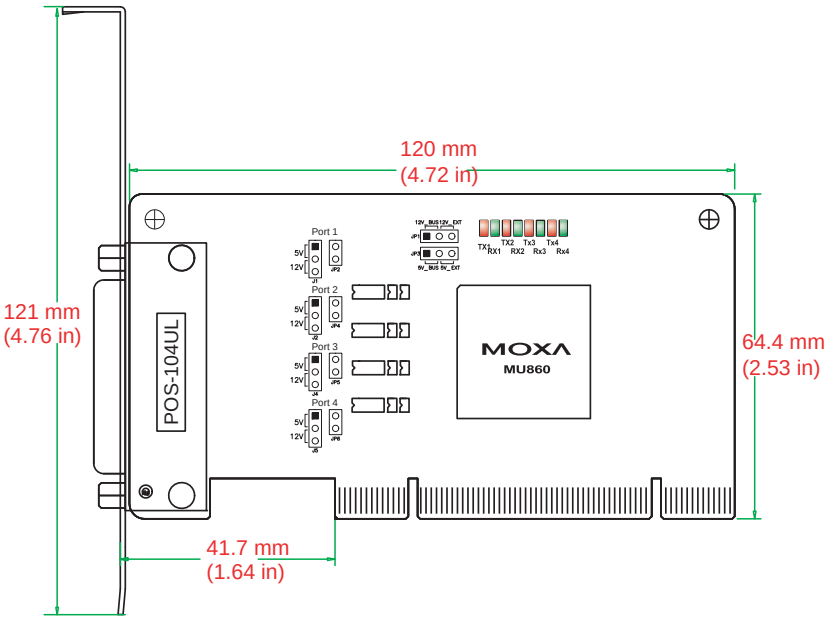
This board does not require configuration.

CP-104JU



This board does not require configuration.

POS-104UL



The onboard jumpers are used to specify the pin 9 power signal for each serial port.

Step a

The top row of jumper pins selects the source of 12V power; the bottom row of jumper pins selects the source of 5V power:

Bus power	External power

If 5V or 12V external power is enabled, you will need to connect the cable from the back of POS-104UL to the PC's power supply. Remove both jumpers to disable all power signals to all ports.

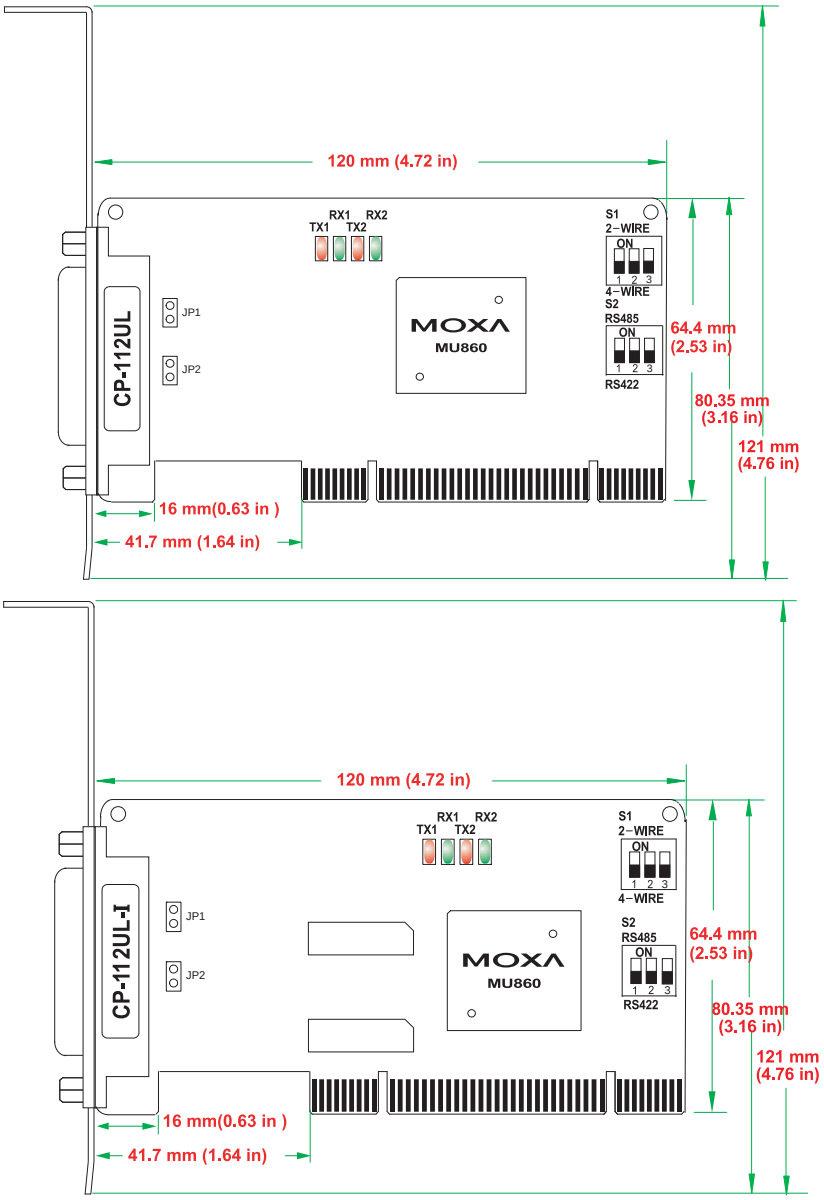
Step b

For each serial port, a set of 5 jumper pins is used select the power signal that is sent to pin 9.

5V	12V	RI signal (input)

To disable pin 9 power signals for a specific port, remove the jumper.

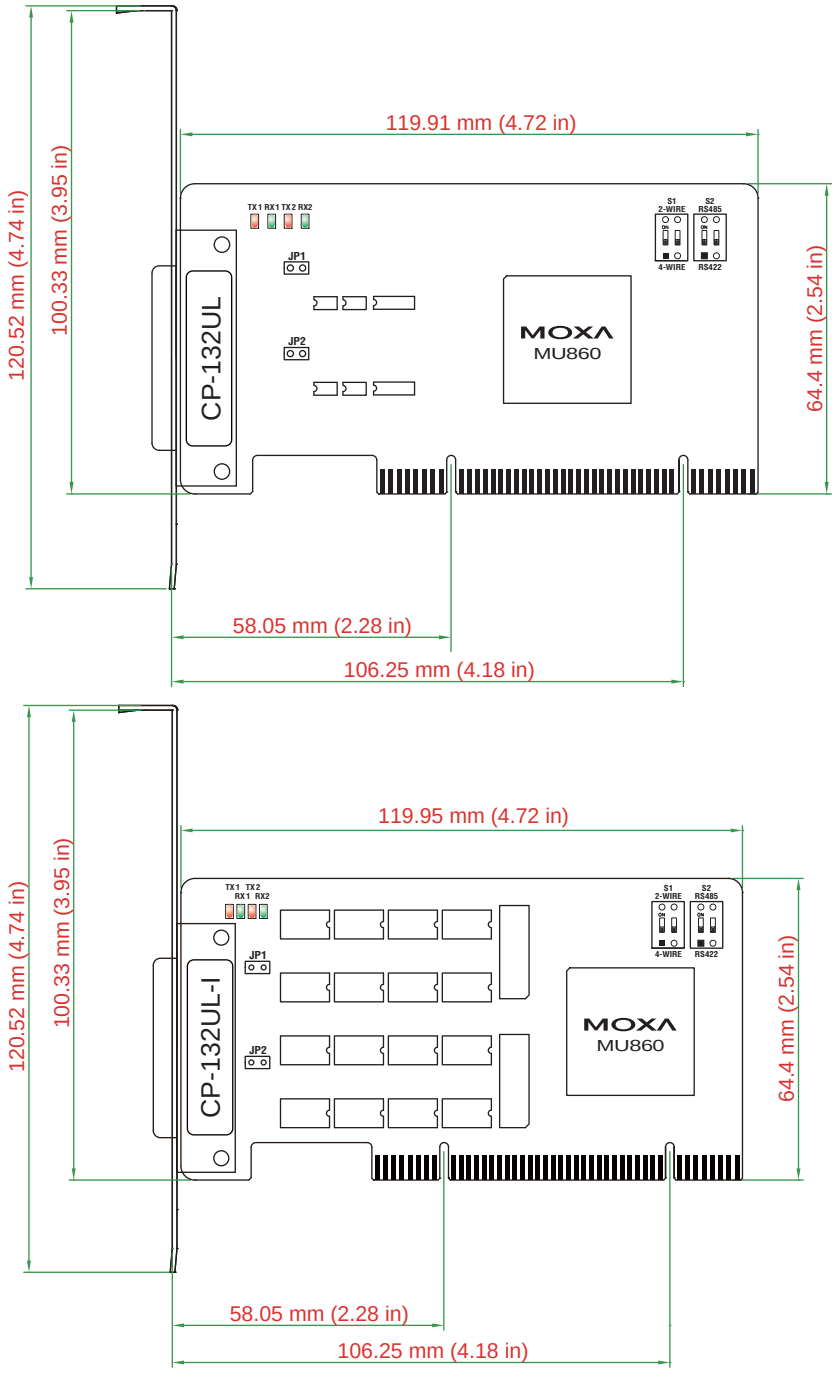
CP-112UL/CP-112UL-I



Onboard termination resistors can be activated individually for each serial port using jumpers JP1 and JP2. JP1 corresponds to serial port 1. Short the jumper pins to activate the termination resistor; leave the jumper pins open to bypass the termination resistor. The onboard DIP switches, S1, S2, and S3, are used to select RS-232, RS-422, or RS-485 mode for each serial port. Switch 1 corresponds to port 1 and switch 2 corresponds to port 2. S1 selects between RS-232, S2 selects between RS-422, and S3 selects between 2-wire and 4-wire RS-485, as follows:

Mode	S1	S2	S3
RS-232	ON	--	--
RS-422	OFF	ON	--
4-Wire RS-485	OFF	OFF	ON
2-Wire RS-485	OFF	OFF	OFF

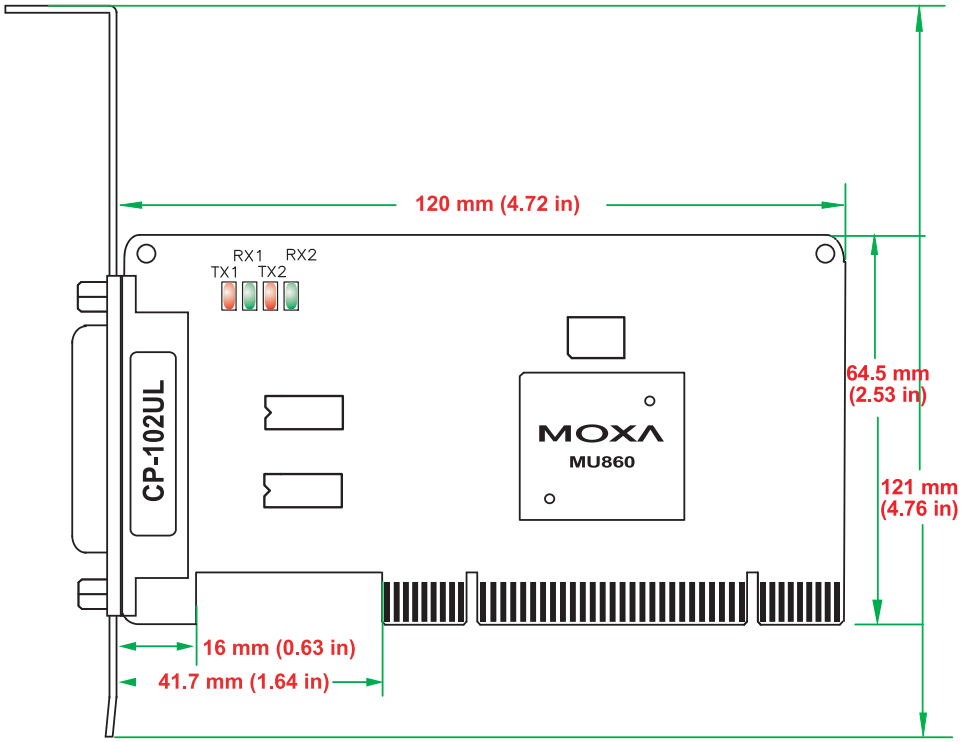
CP-132UL/CP-132UL-I



Onboard termination resistors can be activated individually for each serial port using jumpers JP1 and JP2. JP1 corresponds to serial port 1. Short the jumper pins to activate the termination resistor; leave the jumper pins open to bypass the termination resistor.

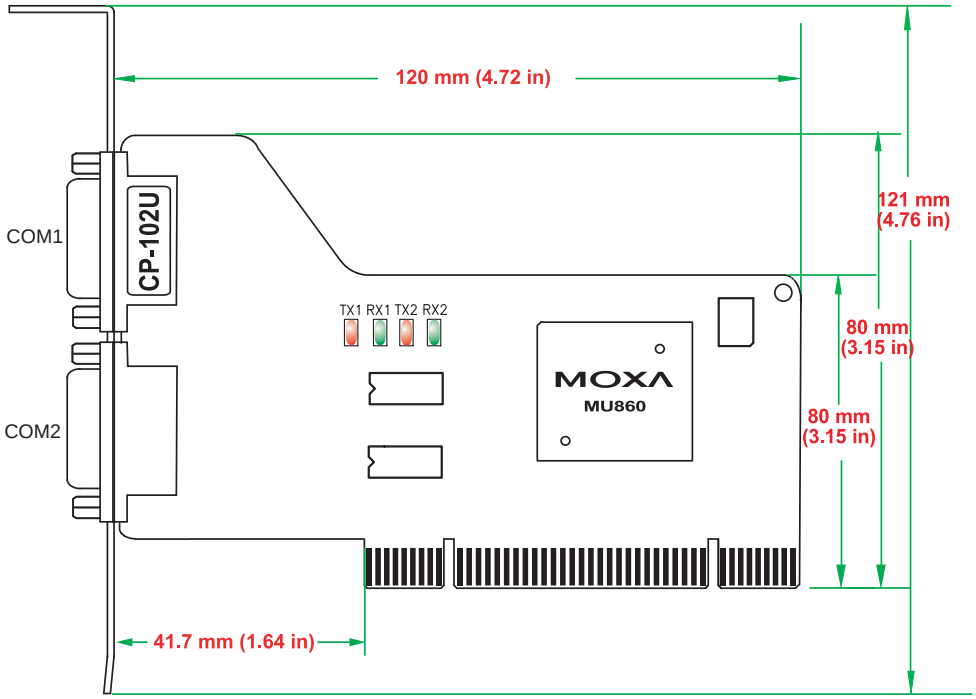
The onboard DIP switches, S1 and S2, are used to select RS-422 or RS-485 mode for each serial port. On each bank, switch 1 corresponds to port 1 and switch 2 corresponds to port 2. S2 selects between RS-422 and RS-485; S1 selects between 2-wire and 4-wire RS-485.

CP-102UL



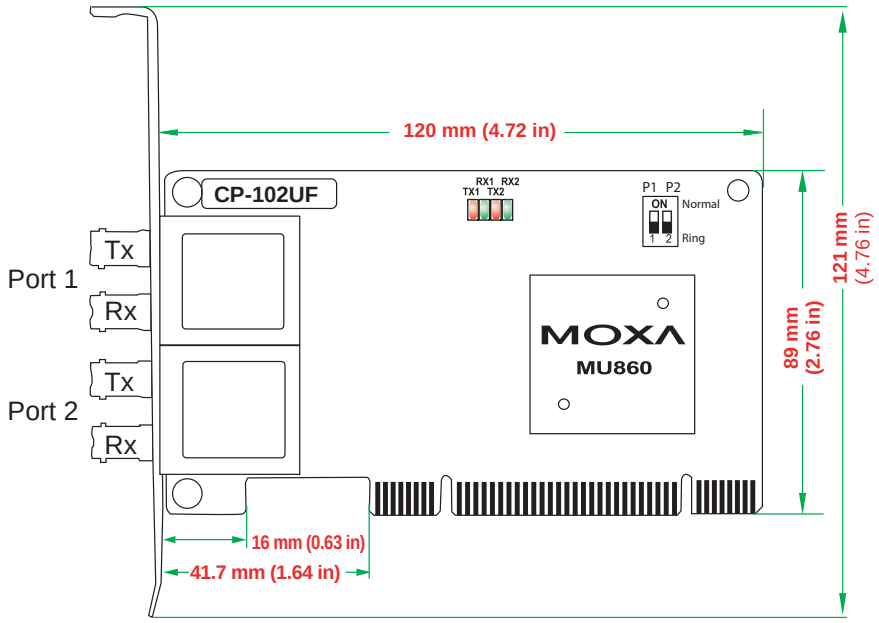
This board does not require configuration.

CP-102U

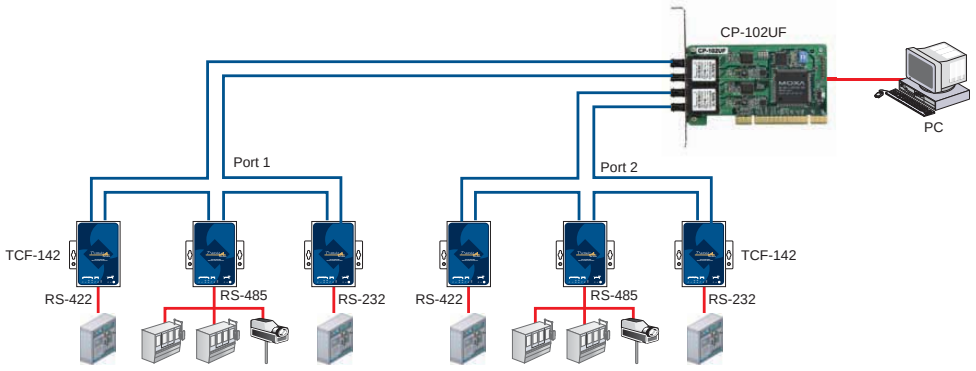


This board does not require configuration.

CP-102UF



The onboard DIP switches are used to configure the CP-102UF for "Ring mode" or "Normal". When using the CP-102UF board, your PC can be included as one node of a fiber ring formed using Moxa's own TCF-142 serial-to-fiber converter. Since each TCF-142 has two fiber ports and one serial port, PCs that are part of the ring will be able to communicate with serial devices connected to the ring. Note that the Tx port of the CP-102UF connects to a neighboring converter's Rx port to form the ring. When one node transmits a signal, the signal travels around the ring until it returns back to the transmitting unit, which then blocks the signals.



NOTE: When configuring two or more CP-102UF boards installed in the same computer, please pay attention to the model names of the boards. The two models can be recognized by the type of connector on the board. Model CP-102UF-M uses plastic ST connectors, whereas model CP-102UF-S uses metal ST connectors.

Plugging the Board into an Expansion Slot

ATTENTION

Safety First!
To avoid damaging your system and board, make sure your PC's power is turned off before installing your Universal PCI Board.

Step 1: Power off the PC.

Step 2: Shut off the power to any peripheral devices and remove the PC's cover.

Step 3: Configure the UPCI board's DIP switches and jumpers as necessary. This only applies to certain models. For additional information, please refer to your model in this chapter.

Step 4: Insert the board firmly into a free PCI or PCI-X slot on the PC.

Step 6: Use a screw to secure the board in place.

Step 7: Replace the PC's cover.

Step 8: Power on the PC. The BIOS will automatically set the IRQ and I/O address.

Step 9: Install the software. For details, please refer to the appropriate chapter for your operating system.

3

Driver Installation: Windows Vista/2008

The following topics are covered in this chapter:

- **Overview**
- **Installing the Driver**
- **Installing the Ports**
- **Verifying the Installation**
- **Configuring the Ports**
- **Disabling the Board**
- **Uninstalling the Board**

Overview

This chapter explains how to install, configure, update, and remove the board drivers for Windows Vista. The following models are supported:

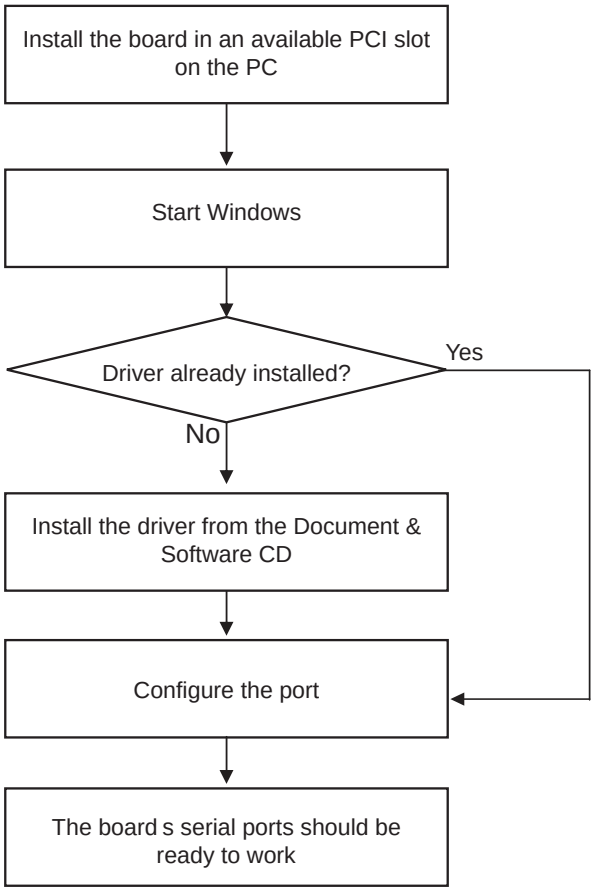
2 Ports	4 Ports	8 Ports
CP-112UL/ CP-112UL-I	CP-114UL / CP-114UL-I	CP-118U / CP-118U-I
CP-132UL / CP-132UL-I	CP-134U / CP-134U-I	CP-138U / CP-138U-I
CP-102UL	CP-104UL	CP-168U
CP-102U	CP-104JU	
CP-102UF	POS-104UL	

Windows Vista supports up to 256 serial ports, from COM1 to COM256. Moxa developed pure 32 and 64-bit Windows device drivers in order to fully utilize the advanced multi-process and multi-thread features of Windows Vista. The drivers conform to the Win32 COMM API standard.

You can download the drivers from the Moxa website. For information on developing your own serial programming applications, please refer to Chapter 9.

Before installing the software, be sure to install the hardware first. For details on installing the hardware, please refer to Chapter 2.

The overall procedure for installing the drivers is shown on the right. A newly installed board will be automatically detected by the operating system.


Install the board in an available PCI slot on the PC
Start Windows
Driver already installed?
Yes
No
Install the driver from the Document & Software CD
Configure the port
The board s serial ports should be ready to work

Installing the Driver

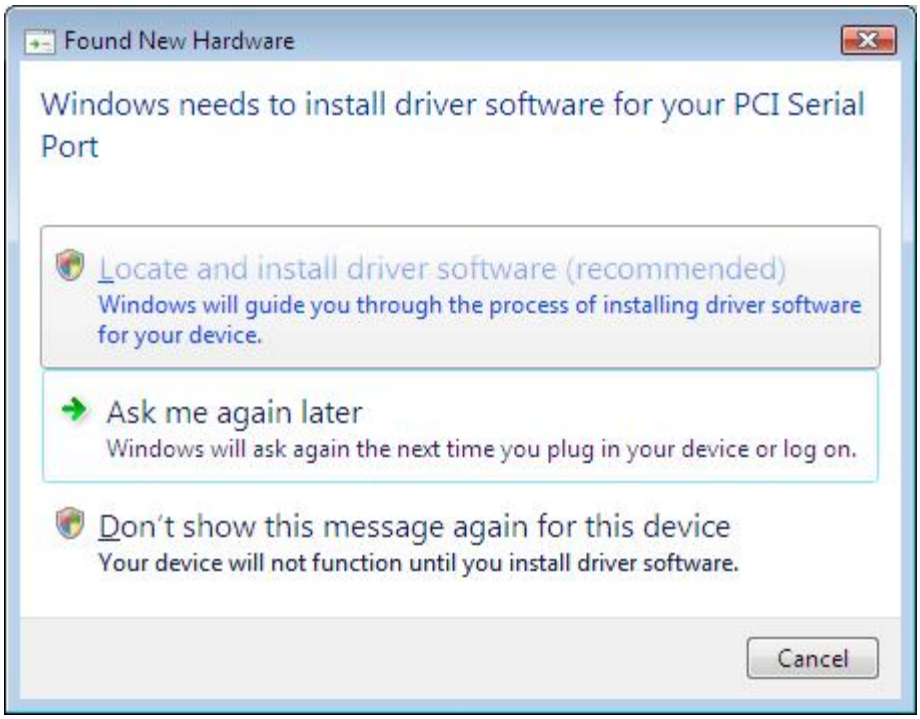
The following instructions show how to install the driver for the first time under Windows Vista. You will need to plug the board in an available PCI or PCI-X slot first, before installing the driver. The installation procedure for Windows 2008 is similar.

ATTENTION

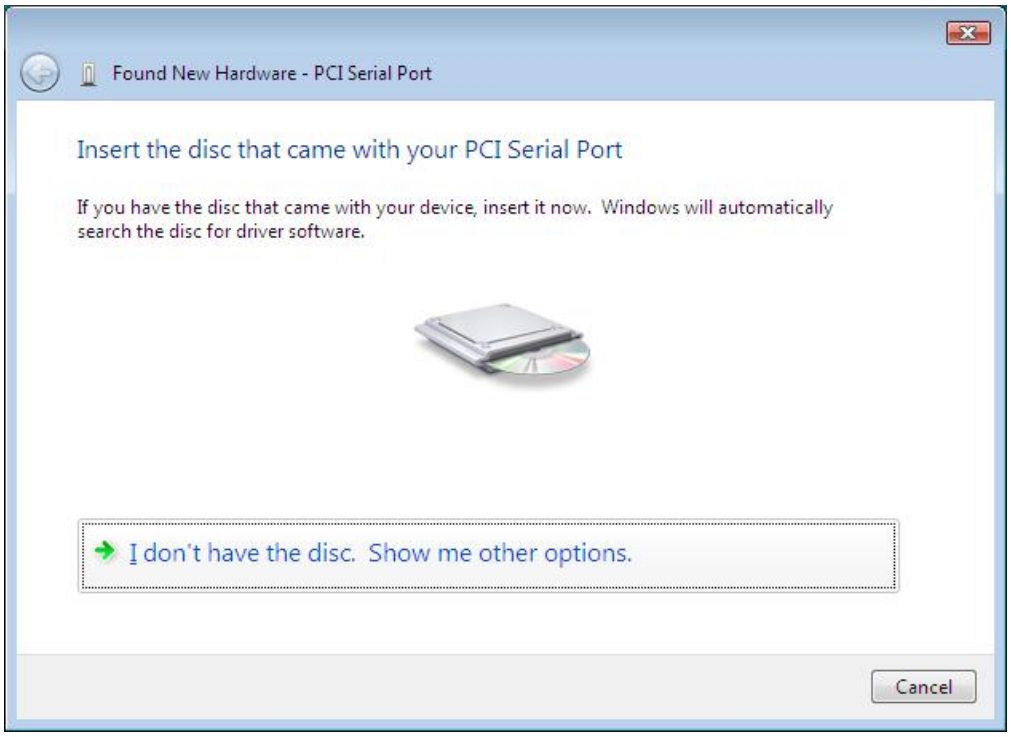
The following steps will not be necessary if a Moxa UPCI board was already installed on your computer. Windows will automatically detect and install any additional board(s) at bootup. In this case, you may proceed directly to configuring the ports.

Note that these instructions use the CP-118U as an example. The procedure for installing all models is the same.

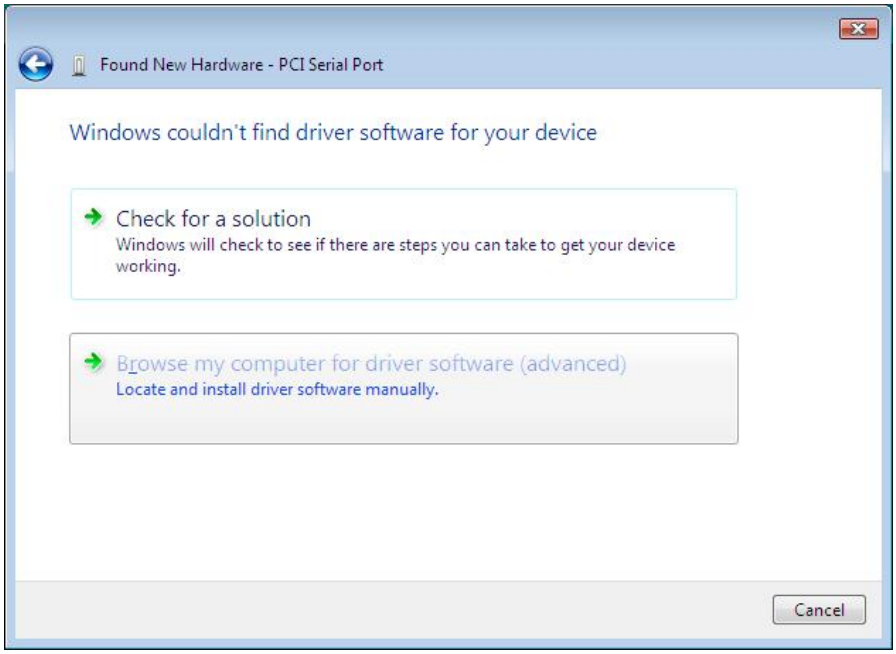
After the board is physically installed and the PC boots up, Windows will automatically detect the new board. The Found New Hardware Wizard window will open automatically. Select **Locate and install driver software (recommended)**.


Found New Hardware
Windows needs to install driver software for your PCI Serial Port
Locate and install driver software (recommended)
Windows will guide you through the process of installing driver software for your device.
Ask me again later
Windows will ask again the next time you plug in your device or log on.
Don't show this message again for this device
Your device will not function until you install driver software.
Cancel

Select **I don't have the disc. Show me other options**.


Found New Hardware - PCI Serial Port
Insert the disc that came with your PCI Serial Port
If you have the disc that came with your device, insert it now. Windows will automatically search the disc for driver software.
I don't have the disc. Show me other options.
Cancel

Select **Browse my computer for driver software (advanced)**.

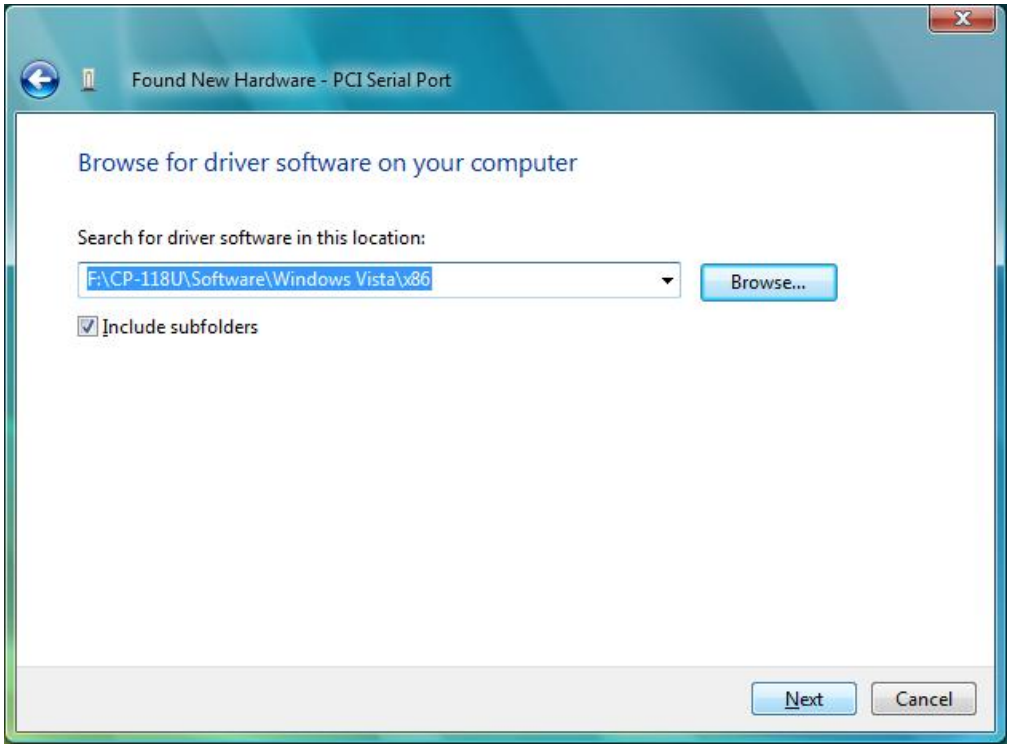

Found New Hardware - PCI Serial Port
Windows couldn't find driver software for your device
Check for a solution
Windows will check to see if there are steps you can take to get your device working.
Browse my computer for driver software (advanced)
Locate and install driver software manually.
Cancel

Click **Browse** and select the appropriate directory on the Document & Software CD for the driver. Drivers for all operating systems are located under the product folder in the \Software directory (e.g., under \CP-118U Series\Software).

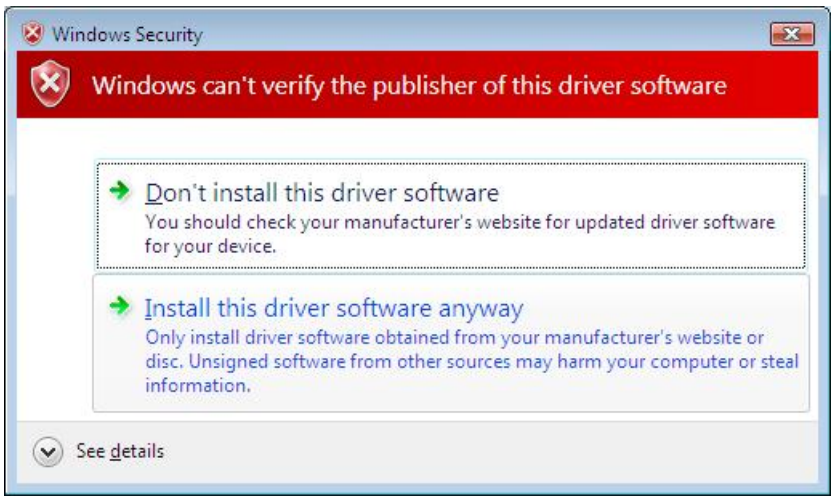
For 32-bit (x86) platforms, select the **\Windows 2008_Vista\x86** folder.

For 64-bit (x64) platforms, select the **\Windows 2008_Vista\x64** folder.

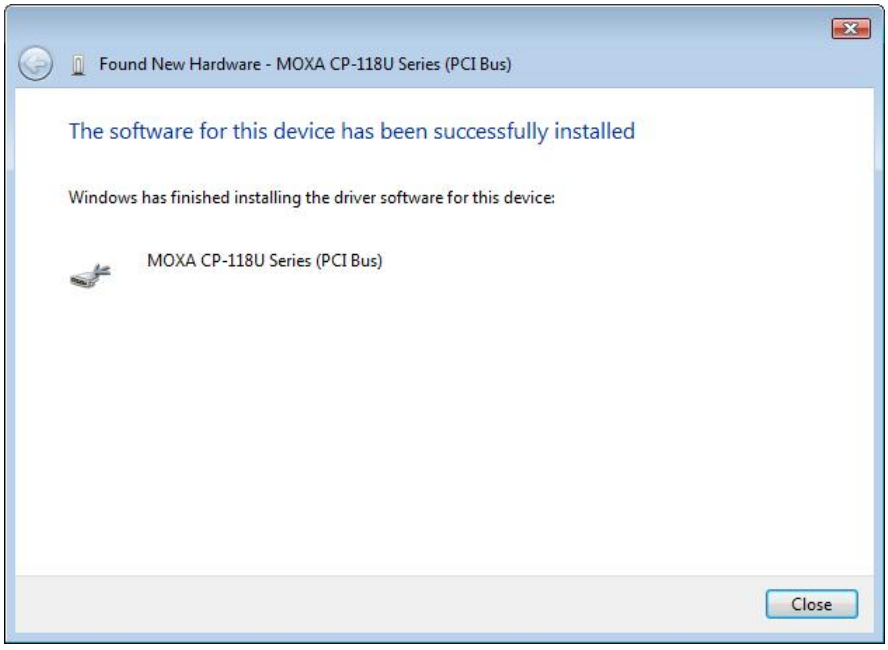
After selecting the folder, click **Next** to continue.



If you receive a warning message stating that the Windows can't verify the publisher of the software, select **Install** this driver software anyway.


Windows Security
Windows can't verify the publisher of this driver software
Don't install this driver software
You should check your manufacturer's website for updated driver software for your device.
Install this driver software anyway
Only install driver software obtained from your manufacturer's website or disc. Unsigned software from other sources may harm your computer or steal information.
See details

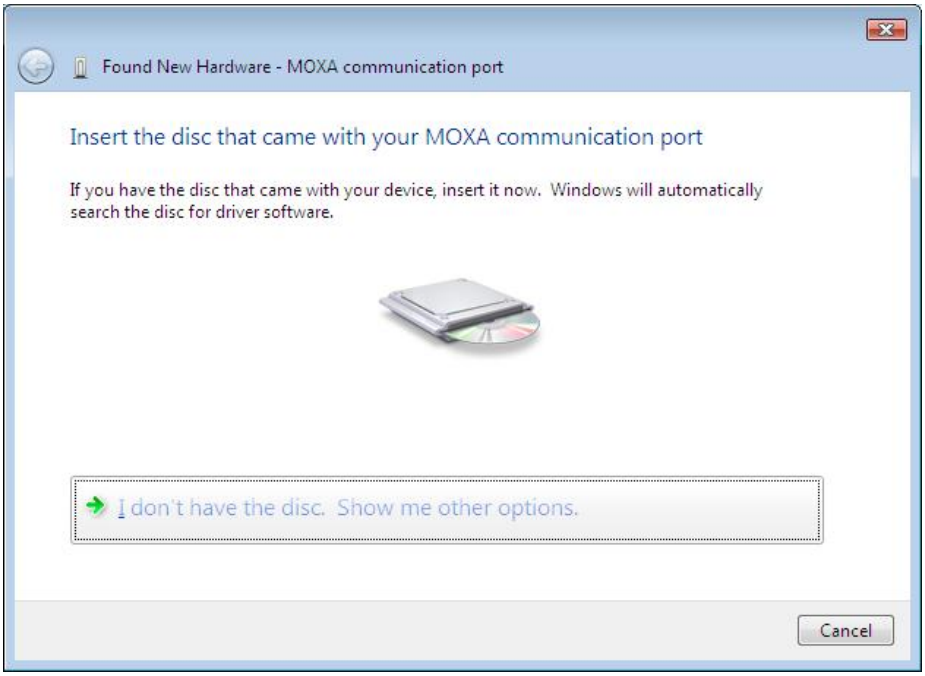
After the drivers have been installed, click **Close** to exit the wizard.


Found New Hardware - MOXA CP-118U Series (PCI Bus)
The software for this device has been successfully installed
Windows has finished installing the driver software for this device:
MOXA CP-118U Series (PCI Bus)
Close

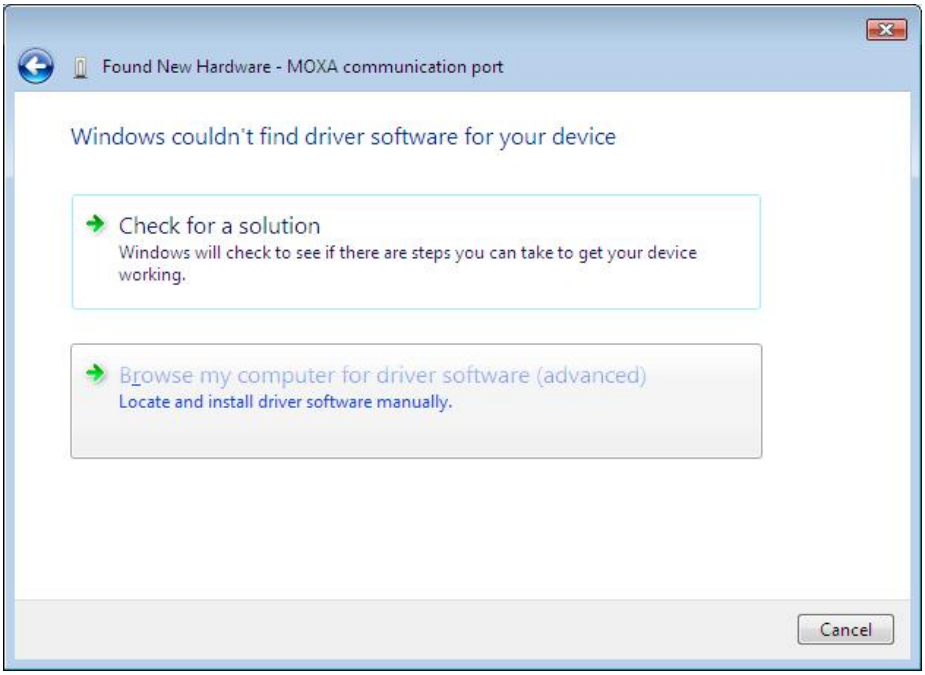
Installing the Ports

After the board and drivers have been installed, an installation wizard will guide you through installation of the newly added serial ports, starting with port 0.

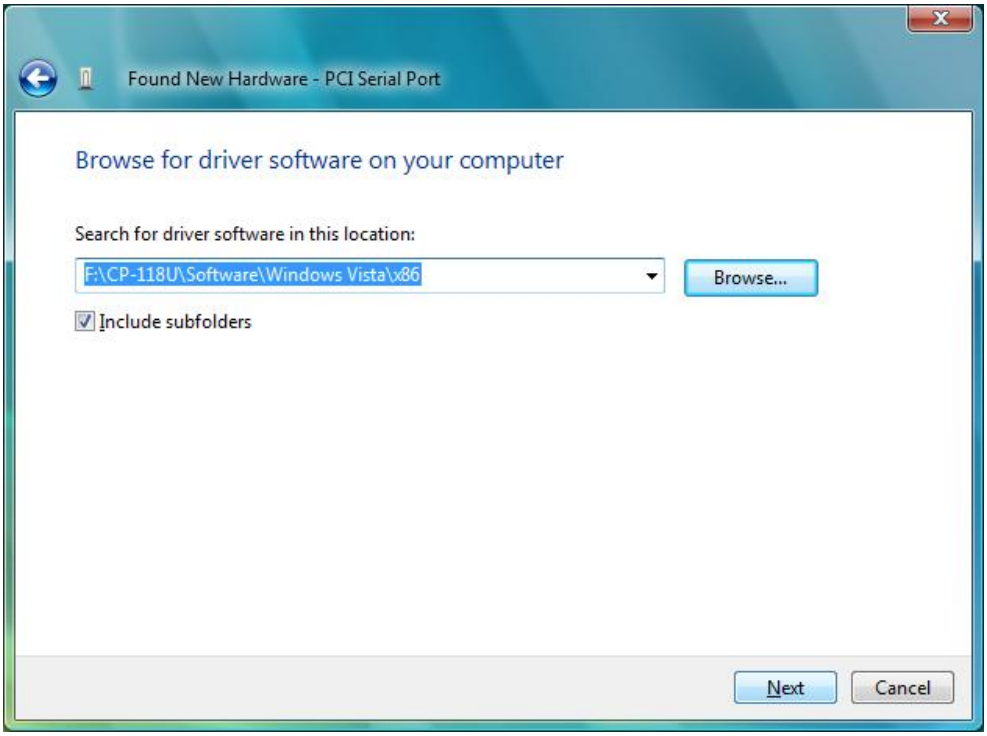
1. When prompted to insert a disc, select **I don't have the disc. Show me other options**.


Found New Hardware - MOXA communication port
Insert the disc that came with your MOXA communication port
If you have the disc that came with your device, insert it now. Windows will automatically search the disc for driver software.
I don't have the disc. Show me other options.
Cancel

Select **Browse my computer for driver software (advanced)**.


Found New Hardware - MOXA communication port
Windows couldn't find driver software for your device
Check for a solution
Windows will check to see if there are steps you can take to get your device working.
Browse my computer for driver software (advanced)
Locate and install driver software manually.
Cancel

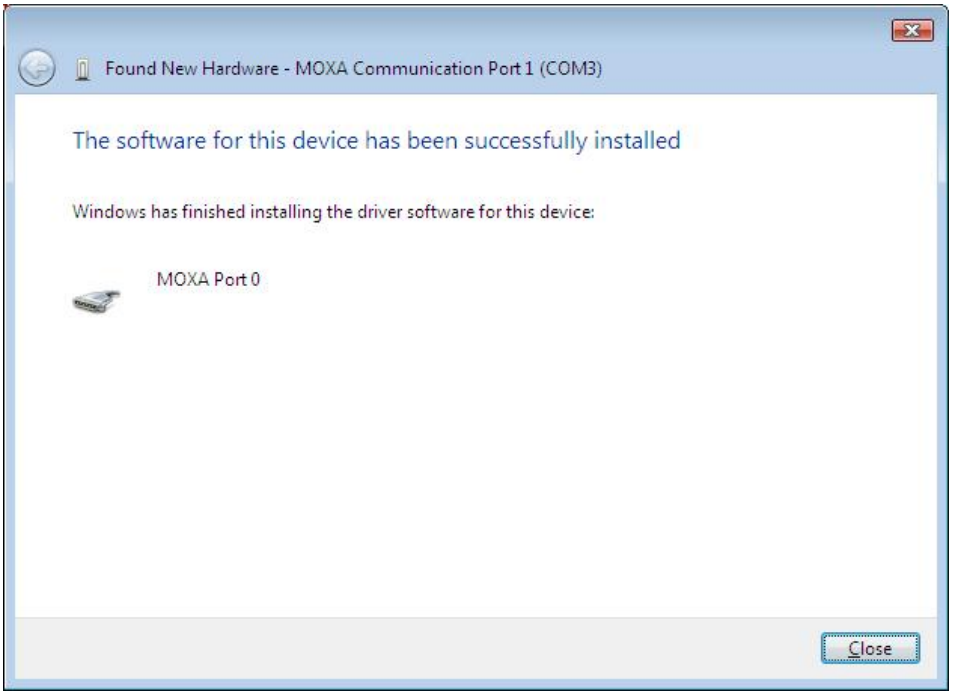
Click **Browse** and select the appropriate directory on the Document & Software CD for the driver. Drivers for all operating systems are located under the product folder in the \Software directory (e.g., under \CP-118U Series\Software). For 32-bit (x86) platforms, select the **\Windows 2008_Vista\x86** folder. For 64-bit (x64) platforms, select the **\Windows 2008_Vista\x64** folder. After selecting the folder, click **Next** to continue.



If you receive a warning message stating that the Windows can't verify the publisher of the software, select **Install** this driver software anyway.

Windows Security
Windows can't verify the publisher of this driver software
Don't install this driver software
You should check your manufacturer's website for updated driver software for your device.
Install this driver software anyway
Only install driver software obtained from your manufacturer's website or disc. Unsigned software from other sources may harm your computer or steal information.
See details

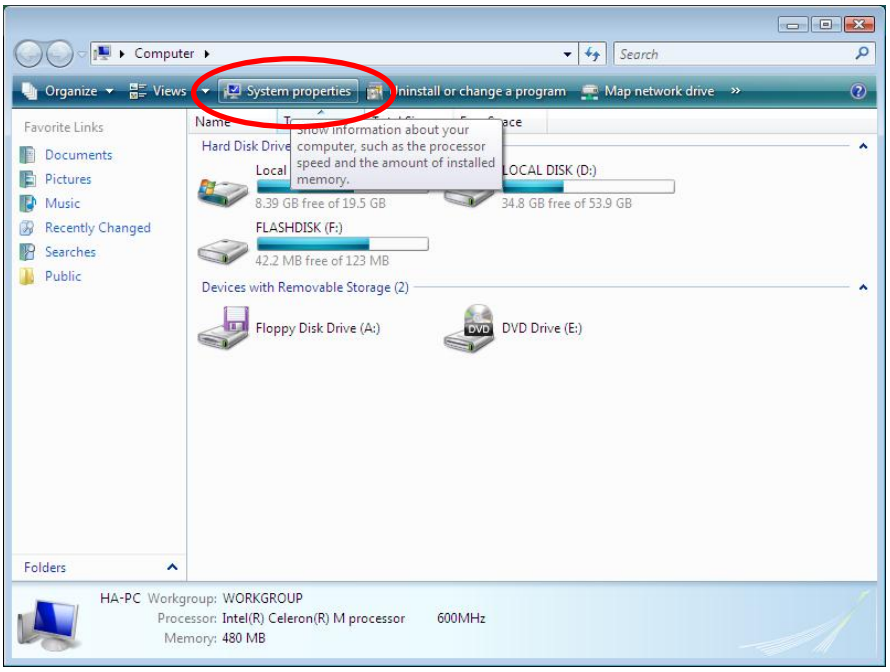
After the drivers have been installed, click **Close to exit the wizard**. The other serial ports will automatically install in the background.


Found New Hardware - MOXA Communication Port 1 (COM3)
The software for this device has been successfully installed
Windows has finished installing the driver software for this device:
MOXA Port 0
Close

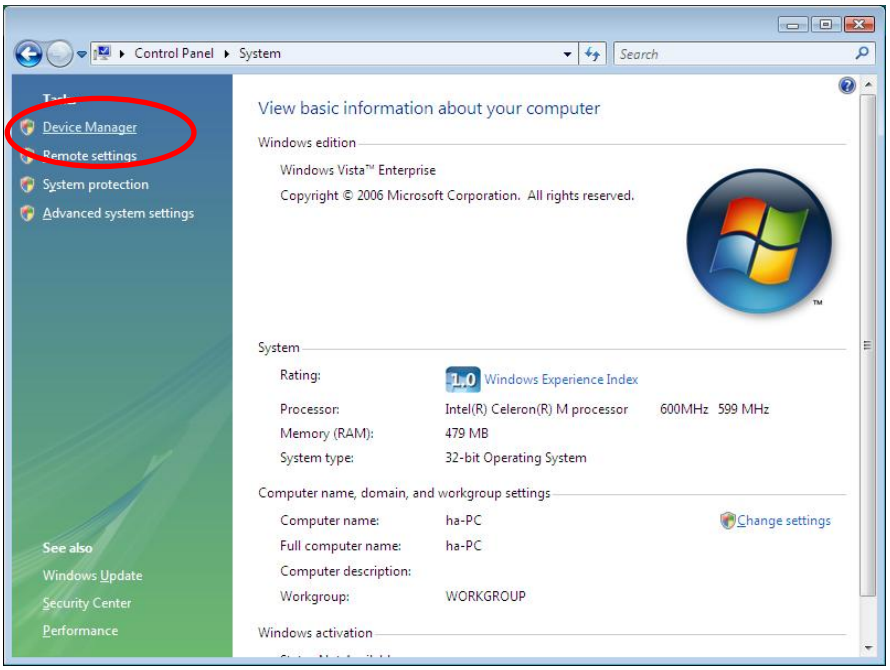
Verifying the Installation

You can use Windows Device Manager to verify proper installation.

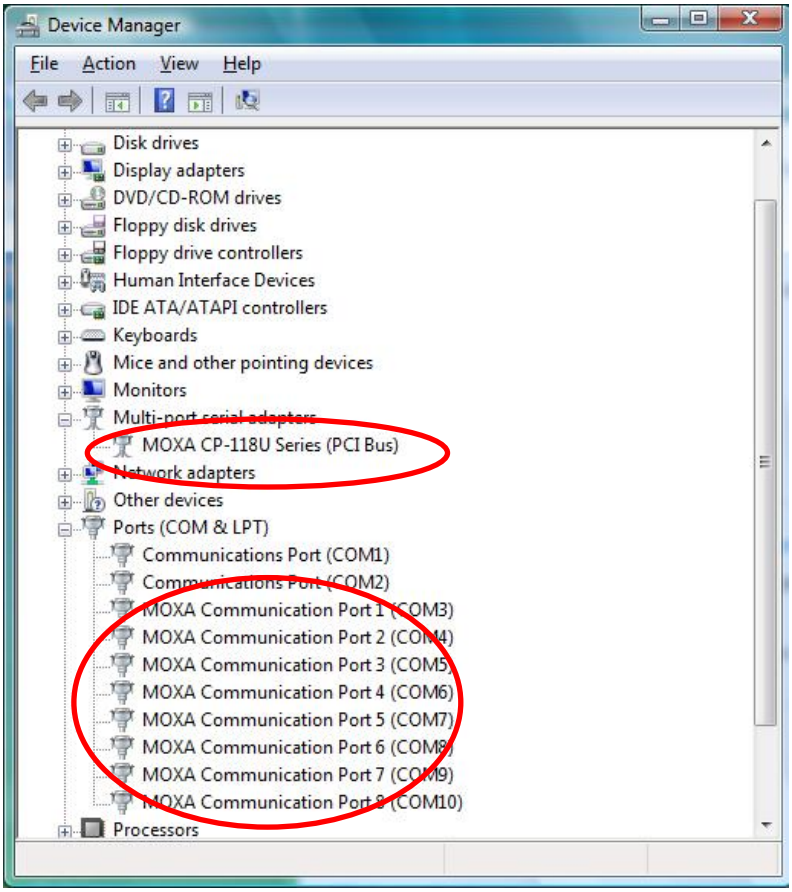
1. Under **My Computer**, click **System Properties**.



In the **System** window, click **Device Manager**.



In the **Device Manager** window, you should see the UPCI board under M**ulti-port serial adapters** (CP-118U in this example). You should also see Moxa communication ports under **Ports (COM & LPT)**.

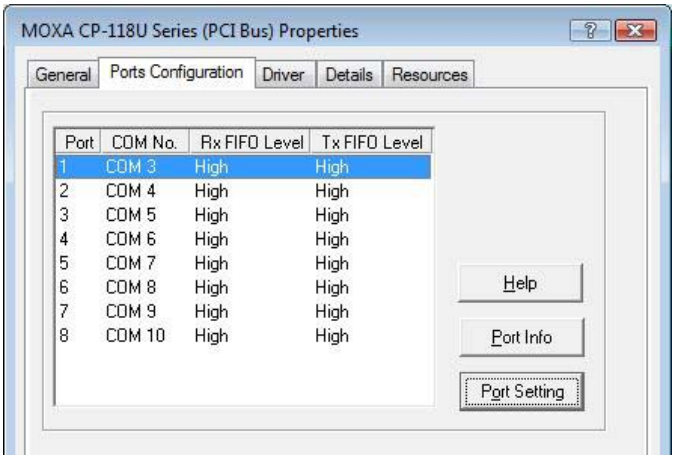


If you see any special marks, such as a question mark or an exclamation mark, next to the Moxa items, the installation of your module or serial ports was not successful. Examine the Windows event log for details.

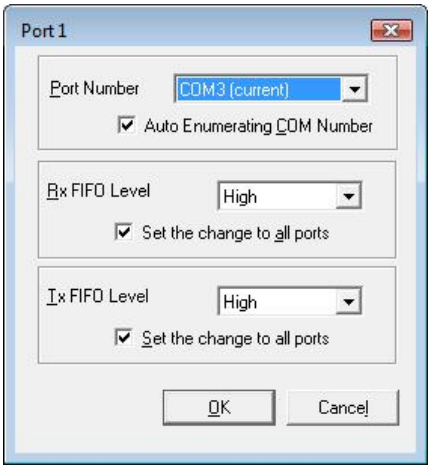
Configuring the Ports

After the board and serial port drivers are installed, the board's **Properties** window will appear. The system will map the ports automatically. You may be prompted to take care of port configuration if other Moxa boards have been installed.

1. On the **Ports Configuration** tab, select a port to configure and click **Port Setting**.



Under **Port Number**, select a COM number to assign to the serial port. Select **Auto Enumerating COM Number** to map subsequent ports in numerical order. For example, if COM 3 is assigned to Port 1, then COM 4 will be automatically assigned to Port 2.



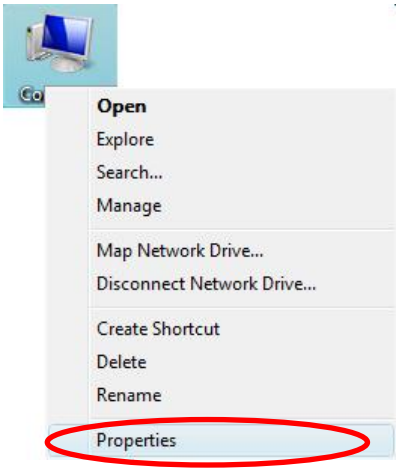
Select an **Rx FIFO Trigger** and **Tx FIFO Size**. The default Rx FIFO Trigger is 120 bytes (high level). The default Tx FIFO Size is 128 bytes (high level). Select **Set the change to all ports** to use this setting for all serial ports on the board.

	Tx FIFO	**Rx FIFO**
High	128	120
Middle	64	60
Low	1	1

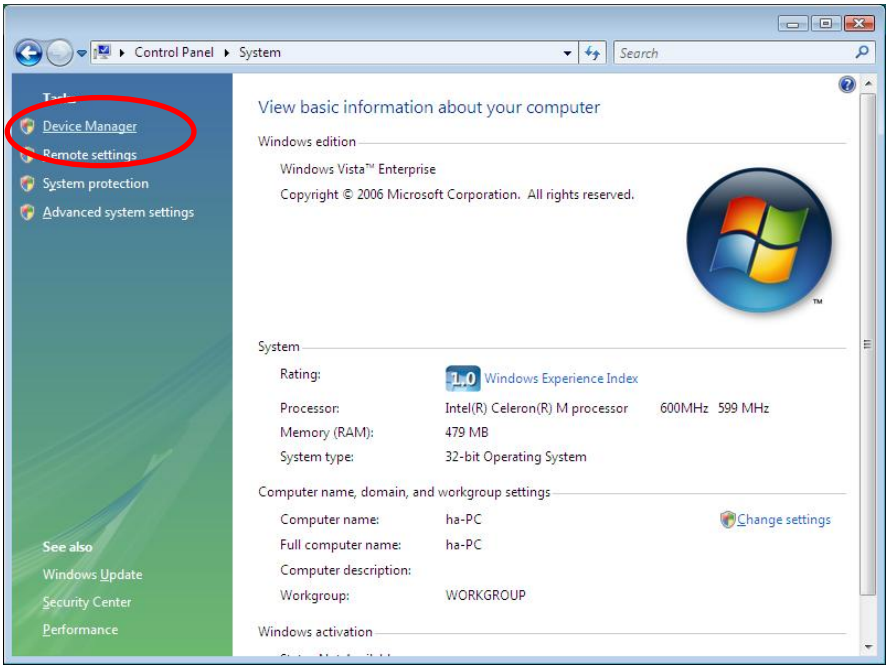
Click **OK** to approve the settings for the selected port. Continue in the same way to configure the other ports. When you have finished setting up the ports, click **OK** to close the **Properties** window and apply the new port settings.

Disabling the Board

1. Right-click **My Computer** and select **Properties** in the context menu.



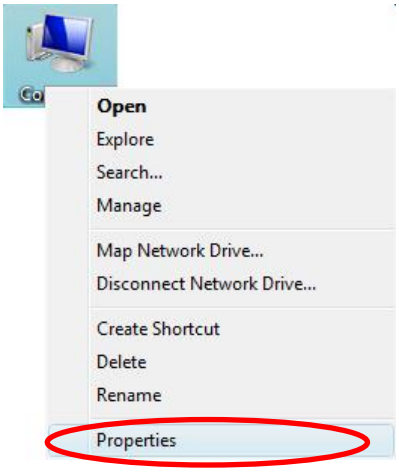
In the **System** window, click **Device Manager**.



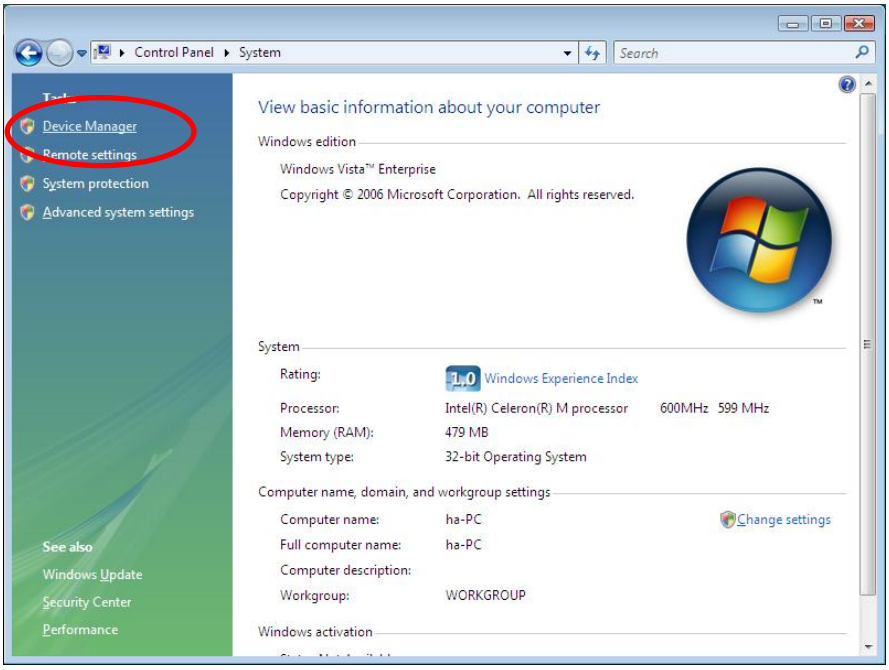
In **Device Manager**, right-click the UPCI board under **Multi-port serial adapters** and select **Disable** in the context menu. This will disable the board.

Uninstalling the Board

1. Right-click **My Computer** and select **Properties** in the context menu.



In the **System** window, click **Device Manager**.



Right-click the UPCI board under **Multi-port serial adapters** (CP-118U in this example) and select **Uninstall** in the context menu.

A confirmation dialog will appear. Click **OK** to uninstall the device.

4

Driver Installation: Windows XP/2003

The following topics are covered in this chapter:

- **Overview**
- **Installing the Driver**
- **Installing the Ports**
- **Verifying the Installation**
- **Configuring the Ports**
- **Using PComm**
- **Using Event Log**
- **Disabling the Board**
- **Uninstalling the Board**

Overview

This chapter explains how to install, configure, update, and remove the board drivers for Windows XP/2003. The following models are supported:

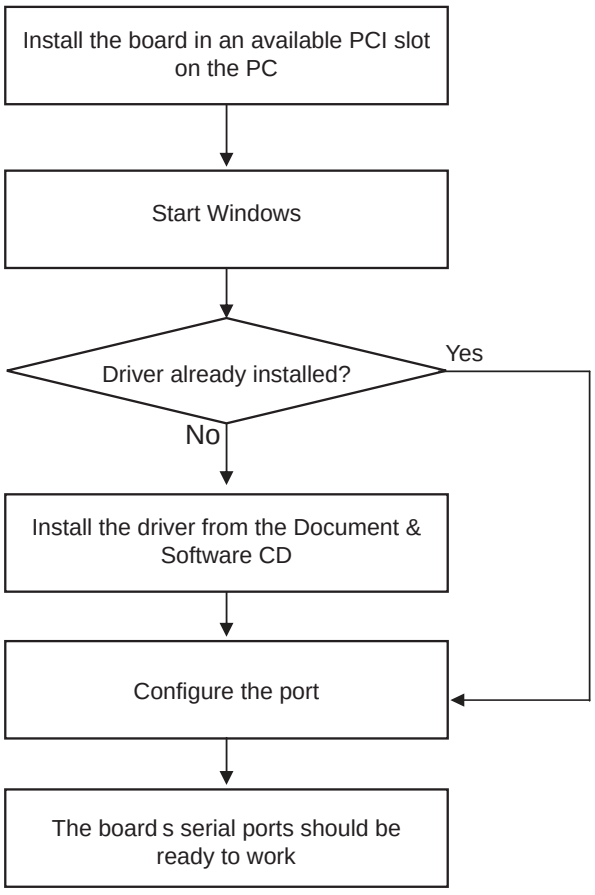
2 Ports	4 Ports	8 Ports
CP-112UL/ CP-112UL-I	CP-114UL / CP-114UL-I	CP-118U / CP-118U-I
CP-132UL / CP-132UL-I	CP-134U / CP-134U-I	CP-138U / CP-138U-I
CP-102UL	CP-104UL	CP-168U
CP-102U	CP-104JU	
CP-102UF	POS-104UL	

Windows XP/2003 supports up to 256 serial ports, from COM1 to COM256. Moxa developed pure 32 and 64-bit Windows device drivers in order to fully utilize the advanced multi-process and multi-thread features of Windows XP/2003. The drivers conform to the Win32 COMM API standard.

You can download the drivers from the Moxa website. For information on developing your own serial programming applications, please refer to Chapter 9.

Before installing the software, be sure to install the hardware first. For details on installing the hardware, please refer to Chapter 2.

The overall procedure for installing the drivers is shown on the right. A newly installed board will be automatically detected by the operating system.


Install the board in an available PCI slot on the PC
Start Windows
Driver already installed?
Yes
No
Install the driver from the Document & Software CD
Configure the port
The board s serial ports should be ready to work

Installing the Driver

The following instructions show how to install the driver for the first time under Windows XP. The same procedure is used for Windows 2003. You will need to plug the board in an available PCI or PCI-X slot first, before installing the driver.

ATTENTION

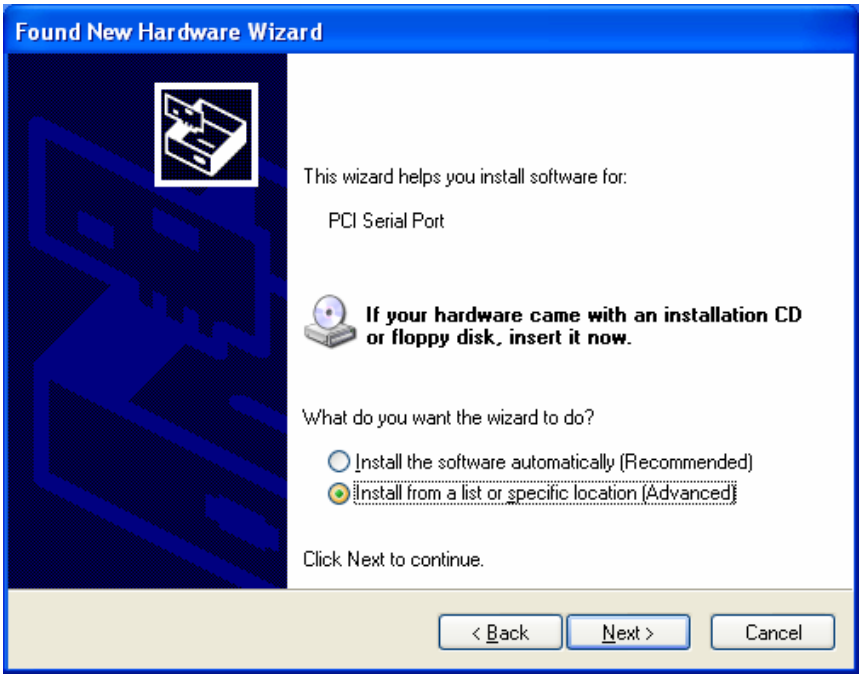
The following steps will not be necessary if a Moxa UPCI board was already installed on your computer. Windows will automatically detect and install any additional board(s) at bootup. In this case, you may proceed directly to configuring the ports.

Note that these instructions use the CP-118U as an example. The procedure for installing all models is the same.

1. After the board is physically installed and the PC boots up, Windows will automatically detect the new board. The Found New Hardware Wizard window will open automatically. When prompted to connect to Windows Update, select. **No, not this time** and click **Next** to continue.

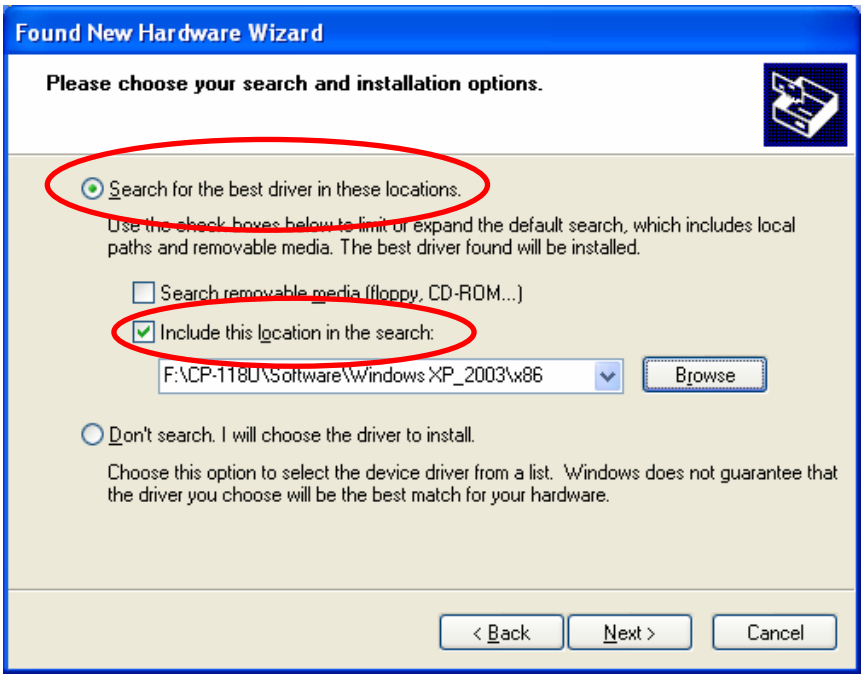
Found New Hardware Wizard
Welcome to the Found New Hardware Wizard
Windows will search for current and updated software by looking on your computer, on the hardware installation CD, or on the Windows Update Web site (with your permission).
Read our privacy policy
Can Windows connect to Windows Update to search for software?
Yes, this time only
Yes, now and every time I connect a device
No, not this time
Click Next to continue.
< Back
Next >
Cancel

Select **Install from a list or specific location (Advanced)** and click **Next** to continue.

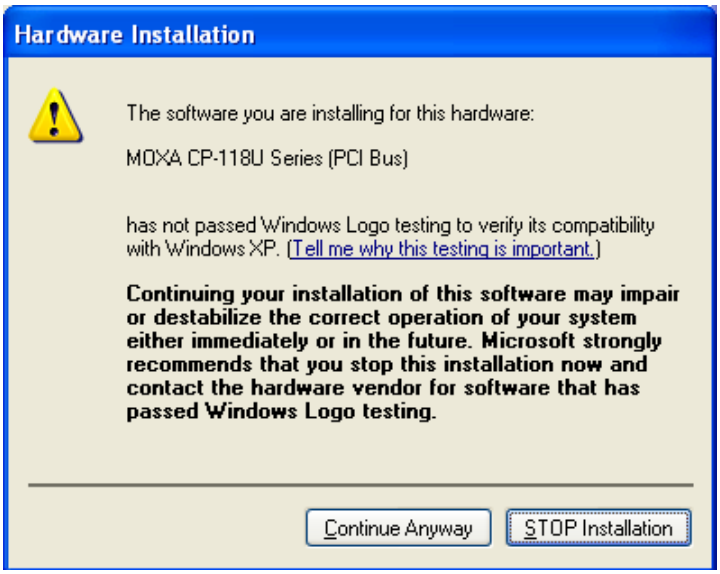

Found New Hardware Wizard
This wizard helps you install software for:
PCI Serial Port
If your hardware came with an installation CD or floppy disk, insert it now.
What do you want the wizard to do?
Install the software automatically (Recommended)
Install from a list or specific location (Advanced)
Click Next to continue.
< Back
Next >
Cancel

Select **Search for the best driver in these locations** and **Include this location in the search**. Click **Browse** and select the appropriate directory on the Document & Software CD for the driver.

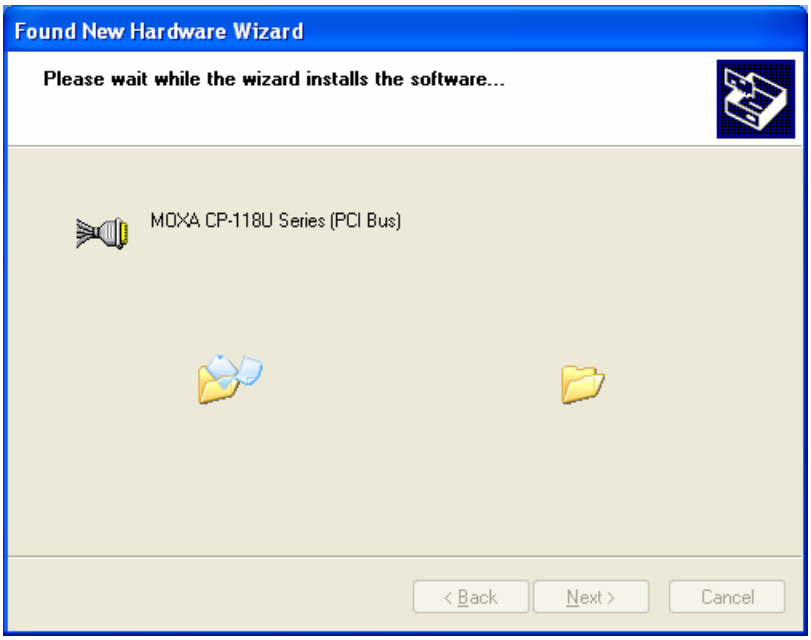
Drivers for all operating systems are located under the product folder in the \Software directory (e.g., under \CP-118U Series\Software). For 32-bit (x86) platforms, select the **\Windows XP_2003\x86** folder. For 64-bit (x64) platforms, select the **\Windows XP_2003\x64** folder. After selecting the folder, click **Next** to continue.

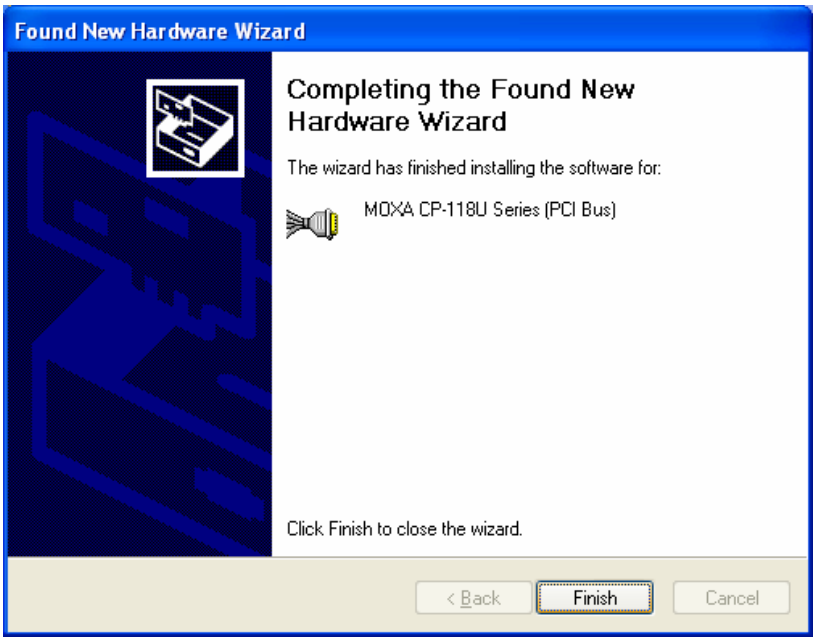

Found New Hardware Wizard
Please choose your search and installation options.
Search for the best driver in these locations.
Use the check boxes below to limit or expand the default search, which includes local paths and removable media. The best driver found will be installed.
Search removable media (floppy, CD-ROM...)
Include this location in the search:
F:\CP-118U\Software\Windows XP_2003\x86
Browse
Don't search. I will choose the driver to install.
Choose this option to select the device driver from a list. Windows does not guarantee that the driver you choose will be the best match for your hardware.
< Back
Next >
Cancel

If you see a warning that the software has not passed Windows Logo testing, click **Continue Anyway**.


Hardware Installation
The software you are installing for this hardware:
MOXA CP-118U Series (PCI Bus)
has not passed Windows Logo testing to verify its compatibility with Windows XP. (Tell me why this testing is important.)
Continuing your installation of this software may impair or destabilize the correct operation of your system either immediately or in the future. Microsoft strongly recommends that you stop this installation now and contact the hardware vendor for software that has passed Windows Logo testing.
Continue Anyway
STOP Installation

Windows will install the drivers. When the installation is complete, click **Finish**.




Found New Hardware Wizard
Completing the Found New Hardware Wizard
The wizard has finished installing the software for:
MOXA CP-118U Series (PCI Bus)
Click Finish to close the wizard.
< Back
Finish
Cancel

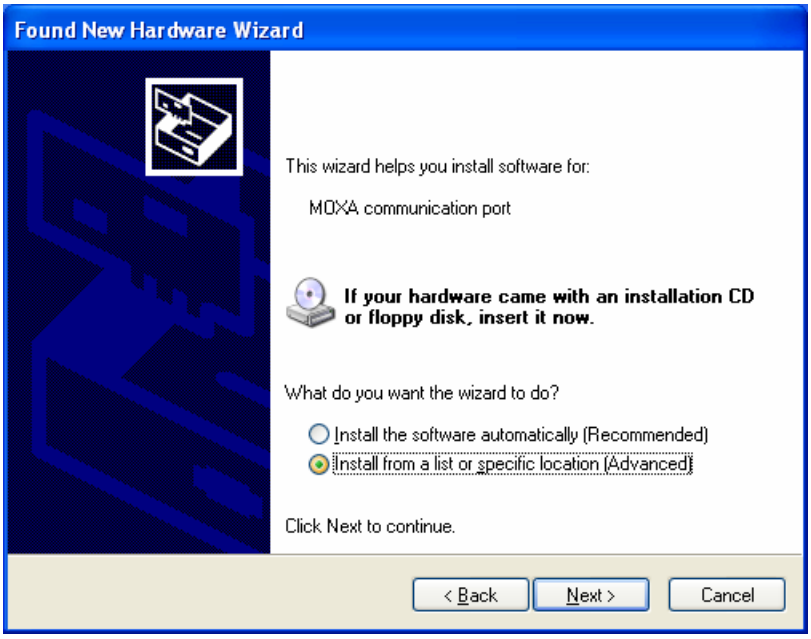
Installing the Ports

After the board and drivers have been installed, an installation wizard will guide you through installation of the newly added serial ports, starting with port 0.

1. When prompted to connect to Windows Update, select **No, not this time** and click **Next** to continue.

Found New Hardware Wizard
Welcome to the Found New Hardware Wizard
Windows will search for current and updated software by looking on your computer, on the hardware installation CD, or on the Windows Update Web site (with your permission).
Read our privacy policy
Can Windows connect to Windows Update to search for software?
Yes, this time only
Yes, now and every time I connect a device
No, not this time
Click Next to continue.
< Back
Next >
Cancel

Select **Install from a list or specific location (Advanced)** and click **Next** to continue.

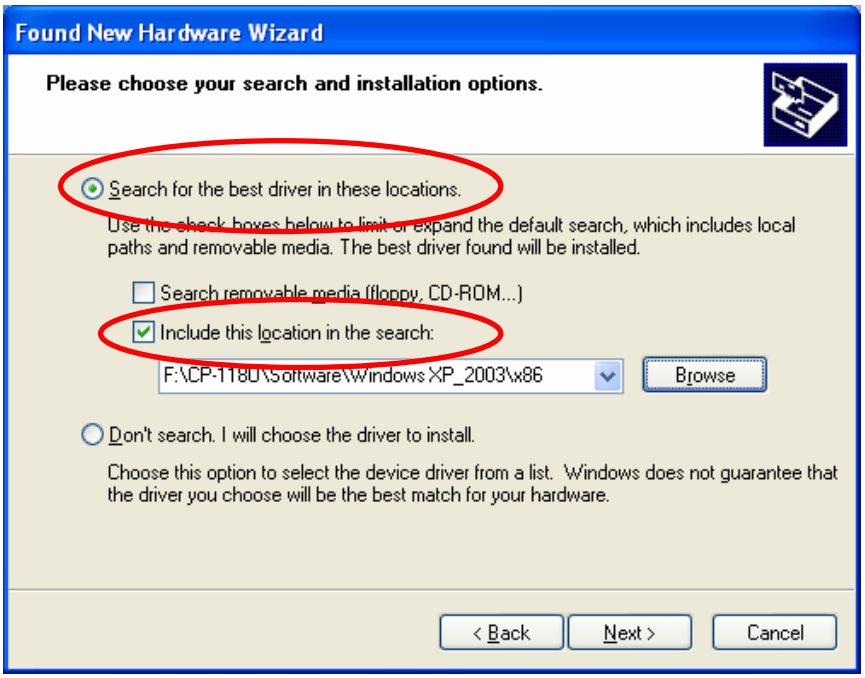

Found New Hardware Wizard
This wizard helps you install software for:
MOXA communication port
If your hardware came with an installation CD or floppy disk, insert it now.
What do you want the wizard to do?
Install the software automatically (Recommended)
Install from a list or specific location (Advanced)
Click Next to continue.
< Back
Next >
Cancel

2. Select **Search for the best driver in these locations** and **Include this location in the search**. Click **Browse** and select the appropriate directory on the Document & Software CD for the driver. Drivers for all operating systems are located under the product folder in the \Software directory (e.g., under \CP-118U Series\Software).

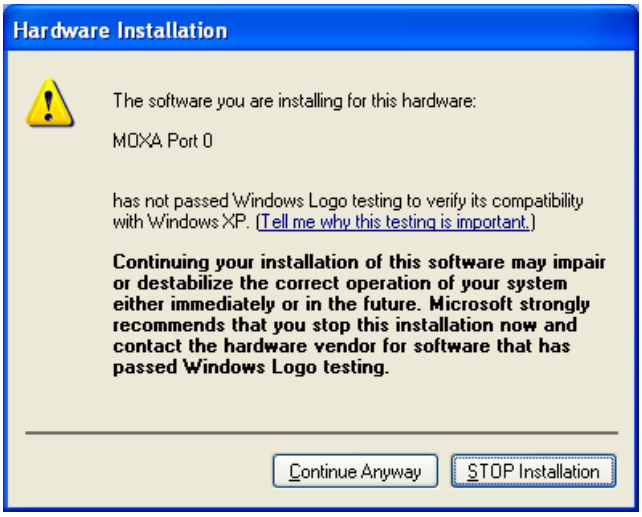
   For 32-bit (x86) platforms, select the **\Windows XP_2003\x86** folder.

   For 64-bit (x64) platforms, select the **\Windows XP_2003\x64** folder.

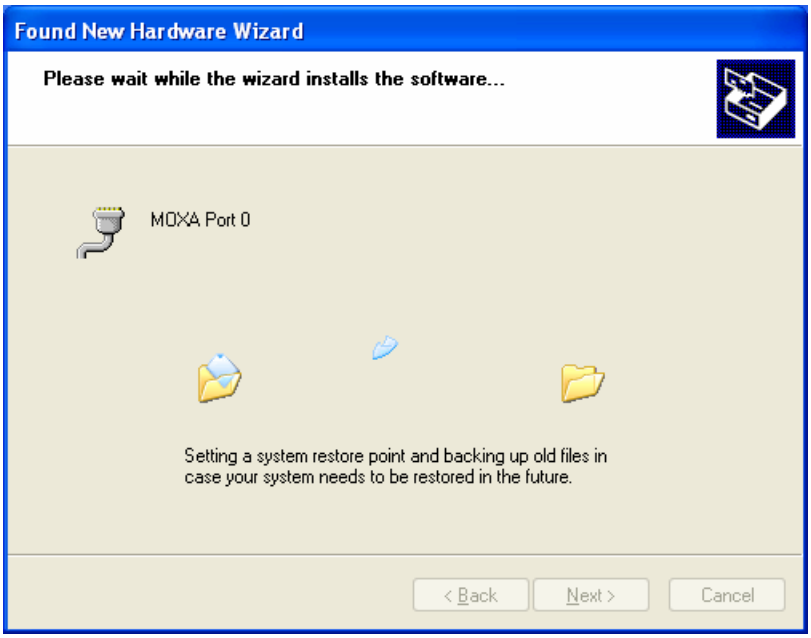
   After selecting the folder, click **Next** to continue.

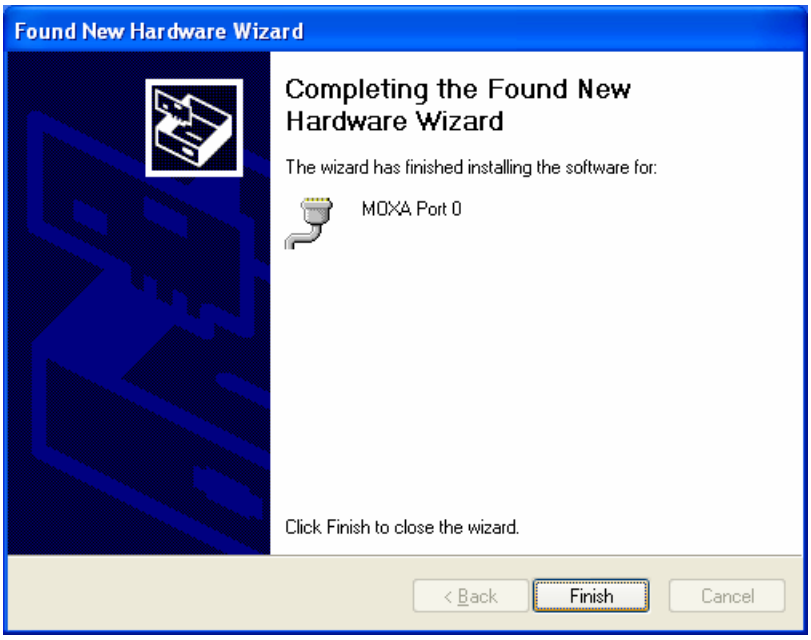

Found New Hardware Wizard
Please choose your search and installation options.
Search for the best driver in these locations.
Use the check boxes below to limit or expand the default search, which includes local paths and removable media. The best driver found will be installed.
Search removable media (floppy, CD-ROM...)
Include this location in the search:
F:\CP-118U\Software\Windows XP_2003\x86
Browse
Don't search. I will choose the driver to install.
Choose this option to select the device driver from a list. Windows does not guarantee that the driver you choose will be the best match for your hardware.
< Back
Next >
Cancel

If you see a warning that the software has not passed Windows Logo testing, click **Continue Anyway**.


Hardware Installation
The software you are installing for this hardware:
MOXA Port 0
has not passed Windows Logo testing to verify its compatibility with Windows XP. (Tell me why this testing is important.)
Continuing your installation of this software may impair or destabilize the correct operation of your system either immediately or in the future. Microsoft strongly recommends that you stop this installation now and contact the hardware vendor for software that has passed Windows Logo testing.
Continue Anyway
STOP Installation

After the drivers for the serial port have been installed, click **Finish** to close the wizard. Repeat this process for the remaining serial ports.

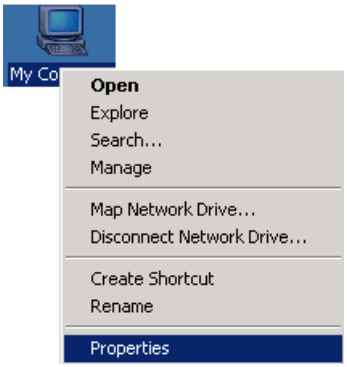

Found New Hardware Wizard
Please wait while the wizard installs the software...
MOXA Port 0
Setting a system restore point and backing up old files in case your system needs to be restored in the future.
< Back
Next >
Cancel



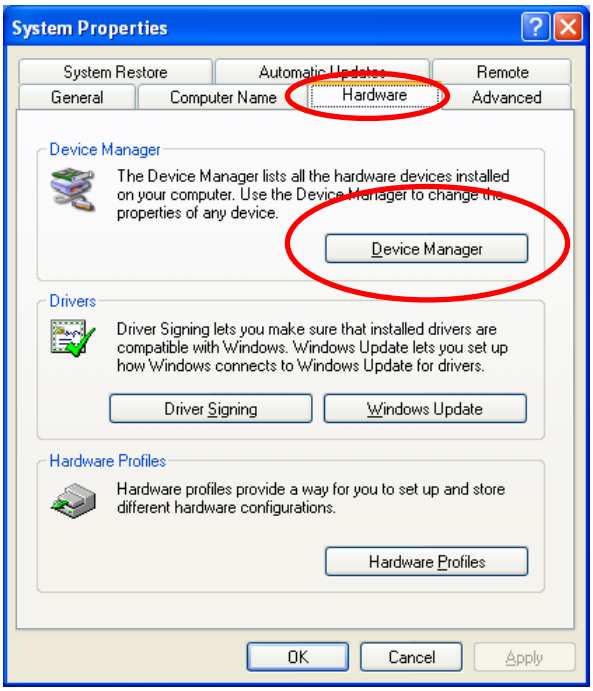
Verifying the Installation

You can use Windows Device Manager to verify proper installation of the board.

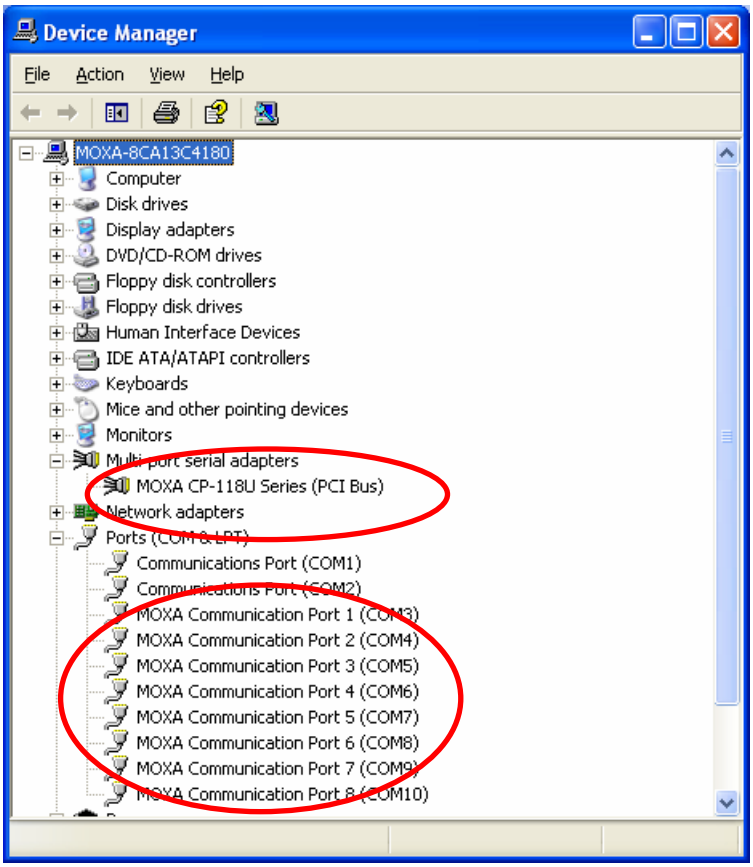
1. Right-click **My Computer** and select **Properties** in the context menu.



In the **Hardware** tab, click **Device Manager**.


System Properties
System Restore
Automatic Updates
Remote
General
Computer Name
Hardware
Advanced
Device Manager
The Device Manager lists all the hardware devices installed on your computer. Use the Device Manager to change the properties of any device.
Device Manager
Drivers
Driver Signing lets you make sure that installed drivers are compatible with Windows. Windows Update lets you set up how Windows connects to Windows Update for drivers.
Driver Signing
Windows Update
Hardware Profiles
Hardware profiles provide a way for you to set up and store different hardware configurations.
Hardware Profiles
OK
Cancel
Apply

In the **Device Manager** window, you should see your UPCI board under M**ulti-port serial adapters** (CP-118U in this example). You should also see Moxa communication ports under **Ports (COM & LPT)**.

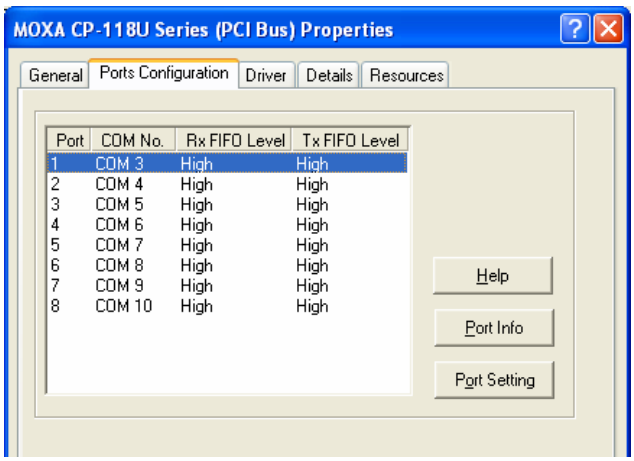


If you see any special marks, such as a question mark or an exclamation mark, next to the Moxa items, the installation of the board was not successful. Examine the Windows event log for details.

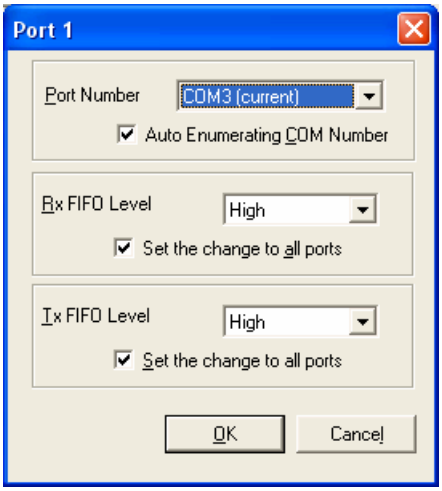
Configuring the Ports

After the board and serial port drivers are installed, the board's **Properties** window will appear. The system will map the ports automatically. You may be prompted to take care of port configuration if other Moxa boards have been installed.

1. On the **Ports Configuration** tab, select a port to configure and click **Port Setting**.



Under **Port Number**, select a COM number to assign to the serial port. Select **Auto Enumerating COM Number** to map subsequent ports in numerical order. For example, if COM 3 is assigned to Port 1, then COM 4 will be automatically assigned to Port 2.



Select an **Rx FIFO Trigger** and **Tx FIFO Size**. The default Rx FIFO Trigger is 120 bytes (high level). The default Tx FIFO Size is 128 bytes (high level). Select **Set the change to all ports** to use this setting for all serial ports on the board.

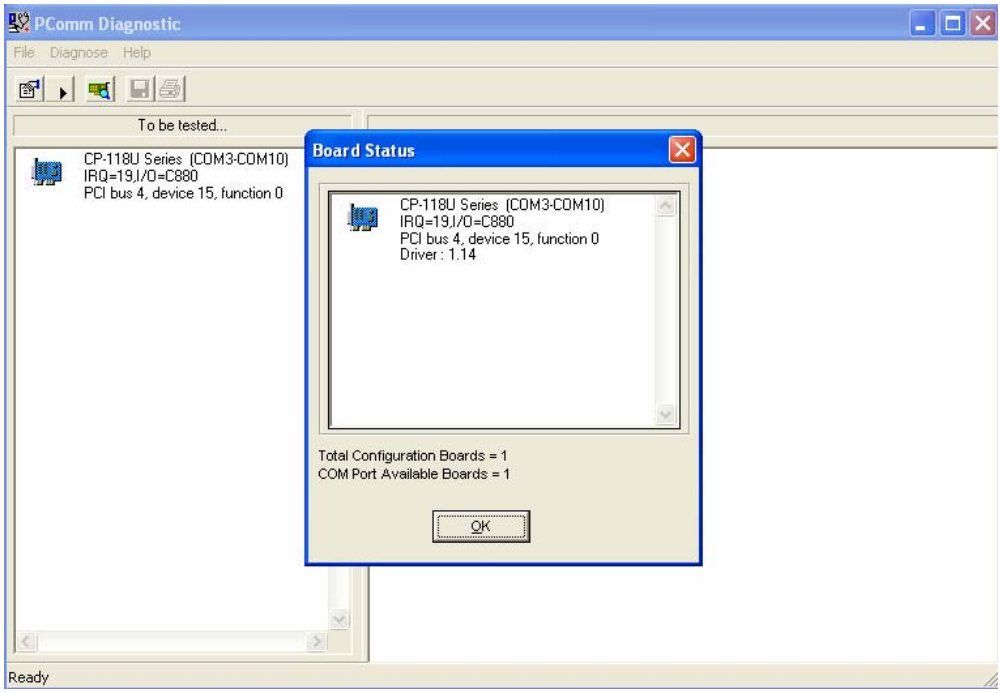
	Tx FIFO	Rx FIFO
High	128	120
Middle	64	60
Low	1	1

Click **OK** to approve the settings for the selected port. Continue in the same way to configure the other ports. When you have finished setting up the ports, click **OK** to close the **Properties** window and apply the new port settings.

Using PComm

PComm Diagnostic is a useful program for checking the board's status. It provides internal and external testing of IRQ, TxD/RxD, UART, CTS/RTS, DTR/DSR, and other items. You can use PComm Diagnostic to verify that the module and serial ports are working properly.

You may download PComm from the Moxa website.

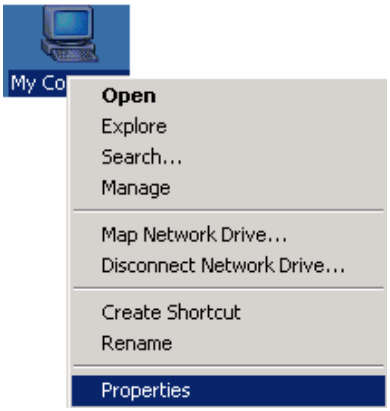


Using Event Log

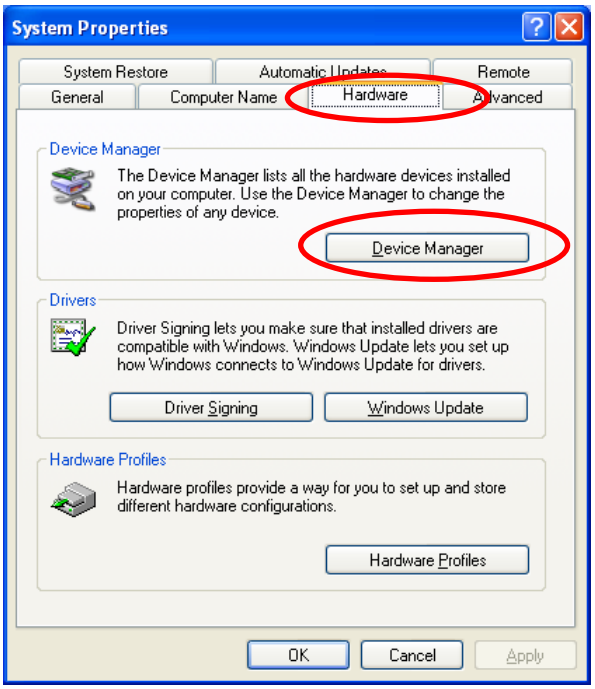
You may refer to the Windows event log to verify operation of the board. To view the event log, open Event Viewer, which is located under Administrative Tools in the Control Panel. Information about the board will be located under the System category.

Disabling the Board

1. Right-click **My Computer** and select **Properties** in the context menu.



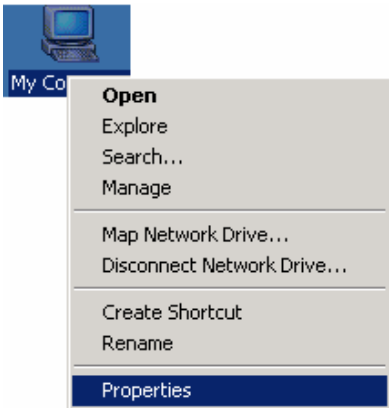
In the **Hardware** tab, click **Device Manager**.


System Properties
System Restore
Automatic Updates
Remote
General
Computer Name
Hardware
Advanced
Device Manager
The Device Manager lists all the hardware devices installed on your computer. Use the Device Manager to change the properties of any device.
Device Manager
Drivers
Driver Signing lets you make sure that installed drivers are compatible with Windows. Windows Update lets you set up how Windows connects to Windows Update for drivers.
Driver Signing
Windows Update
Hardware Profiles
Hardware profiles provide a way for you to set up and store different hardware configurations.
Hardware Profiles
OK
Cancel
Apply

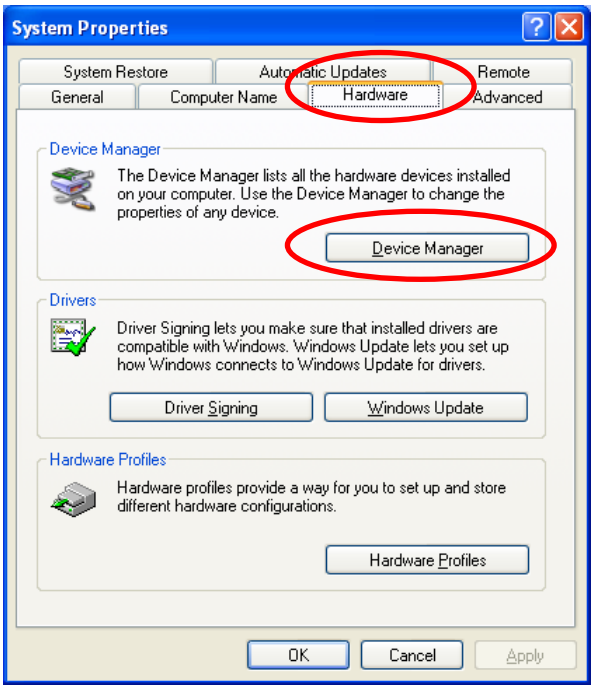
In **Device Manager**, right-click the UPCI board under **Multi-port serial adapters** and select **Disable** in the context menu. This will disable the board.

Uninstalling the Board

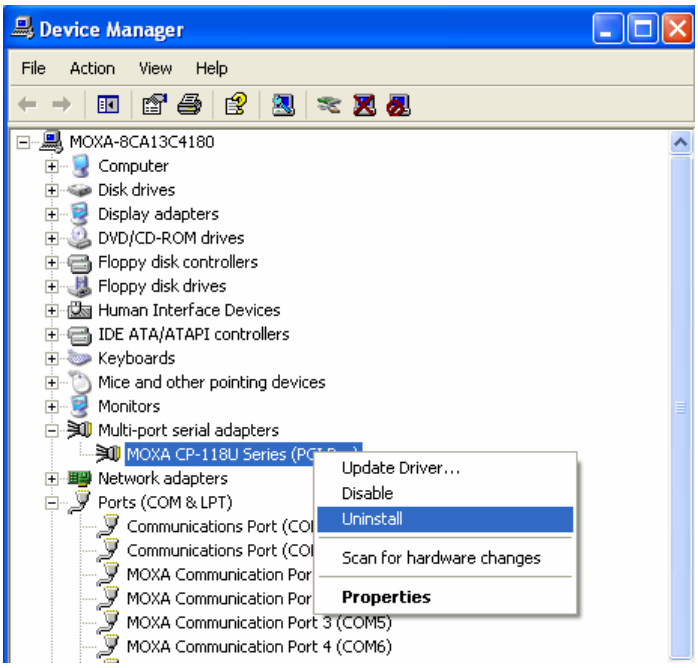
1. Right-click **My Computer** and select **Properties** in the context menu.



In the **Hardware** tab, click **Device Manager**.


System Properties
System Restore
Automatic Updates
Remote
General
Computer Name
Hardware
Advanced
Device Manager
The Device Manager lists all the hardware devices installed on your computer. Use the Device Manager to change the properties of any device.
Device Manager
Drivers
Driver Signing lets you make sure that installed drivers are compatible with Windows. Windows Update lets you set up how Windows connects to Windows Update for drivers.
Driver Signing
Windows Update
Hardware Profiles
Hardware profiles provide a way for you to set up and store different hardware configurations.
Hardware Profiles
OK
Cancel
Apply

Right-click the UPCI board under **Multi-port serial adapters** (CP-118U in this example) and select **Uninstall** in the context menu.



A confirmation dialog will appear. Click **OK** to uninstall the device.

5
Driver Installation: Windows 2000

The following topics are covered in this chapter:

- **Overview**
- **Installing the Driver**
- **Installing the Ports**
- **Verifying the Installation**
- **Configuring the Ports**
- **Using PComm**
- **Using Event Log**
- **Disabling the Board**
- **Uninstalling the Board**

Overview

This chapter explains how to install, configure, update, and remove the board drivers for Windows 2000. The following models are supported:

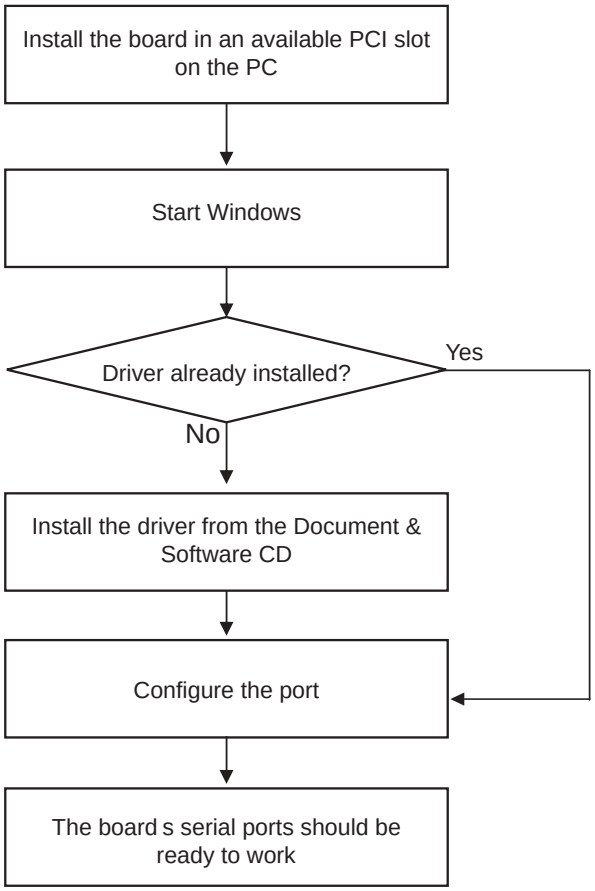
2 Ports	4 Ports	8 Ports
CP-112UL/ CP-112UL-I	CP-114UL / CP-114UL-I	CP-118U / CP-118U-I
CP-132UL / CP-132UL-I	CP-134U / CP-134U-I	CP-138U / CP-138U-I
CP-102UL	CP-104UL	CP-168U
CP-102U	CP-104JU	
CP-102UF	POS-104UL	

Windows 2000 supports up to 256 serial ports, from COM1 to COM256. Moxa developed pure 32-bit Windows device drivers in order to fully utilize the advanced multi-process and multi-thread features of Windows 2000. The drivers conform to the Win32 COMM API standard.

You can download the drivers from the Moxa website. For information on developing your own serial programming applications, please refer to Chapter 9.

Before installing the software, be sure to install the hardware first. For details on installing the hardware, please refer to Chapter 2.

The overall procedure for installing the drivers is shown on the right. A newly installed board will be automatically detected by the operating system.


Install the board in an available PCI slot on the PC
Start Windows
Driver already installed?
Yes
No
Install the driver from the Document & Software CD
Configure the port
The board s serial ports should be ready to work

Installing the Driver

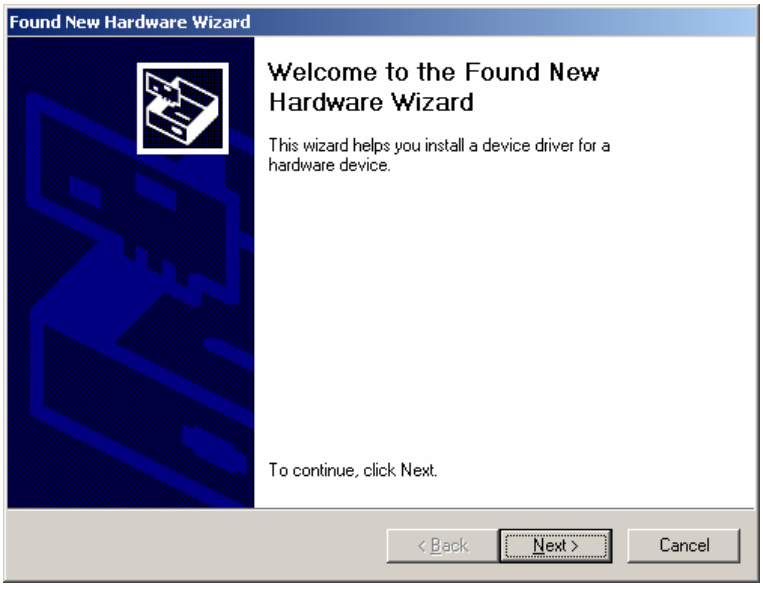
The following instructions show how to install the driver for the first time under Windows 2000. You will need to plug the board in an available PCI or PCI-X slot first, before installing the driver.

ATTENTION

The following steps will not be necessary if a Moxa UPCI board was already installed on your computer. Windows will automatically detect and install any additional board(s) at bootup. In this case, you may proceed directly to configuring the ports.

Note that these instructions use the CP-118U as an example. The procedure for installing all models is the same.

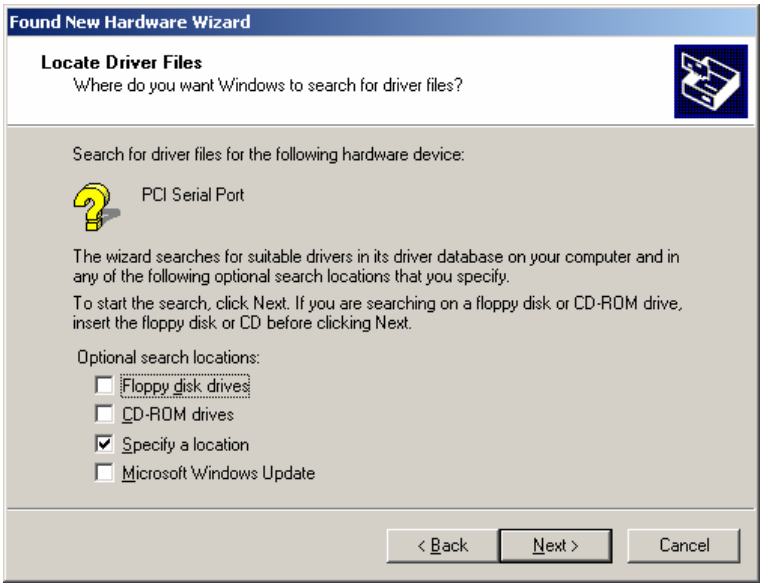
1. After the board is physically installed and the PC boots up, Windows will automatically detect the new board and the Found New Hardware Wizard window will open automatically. Click **Next** to continue.


Found New Hardware Wizard
Welcome to the Found New Hardware Wizard
This wizard helps you install a device driver for a hardware device.
To continue, click Next.
< Back
Next >
Cancel

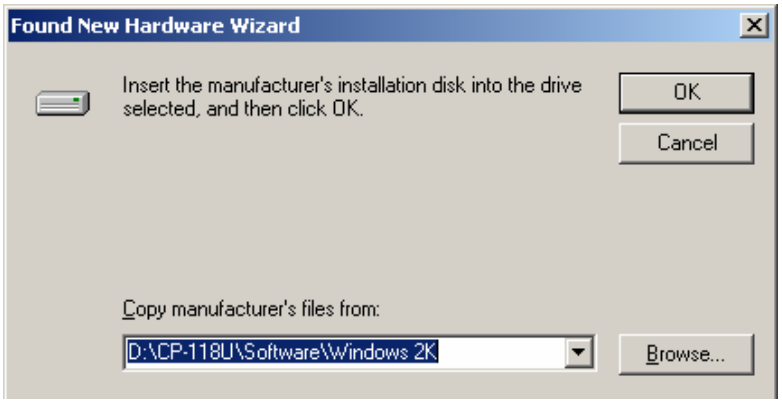
Select **Search for a suitable driver for my device (recommended)** and click **Next** to continue.

Found New Hardware Wizard
Install Hardware Device Drivers
A device driver is a software program that enables a hardware device to work with an operating system.
This wizard will complete the installation for this device:
PCI Serial Port
A device driver is a software program that makes a hardware device work. Windows needs driver files for your new device. To locate driver files and complete the installation click Next.
What do you want the wizard to do?
Search for a suitable driver for my device (recommended)
Display a list of the known drivers for this device so that I can choose a specific driver
< Back
Next >
Cancel

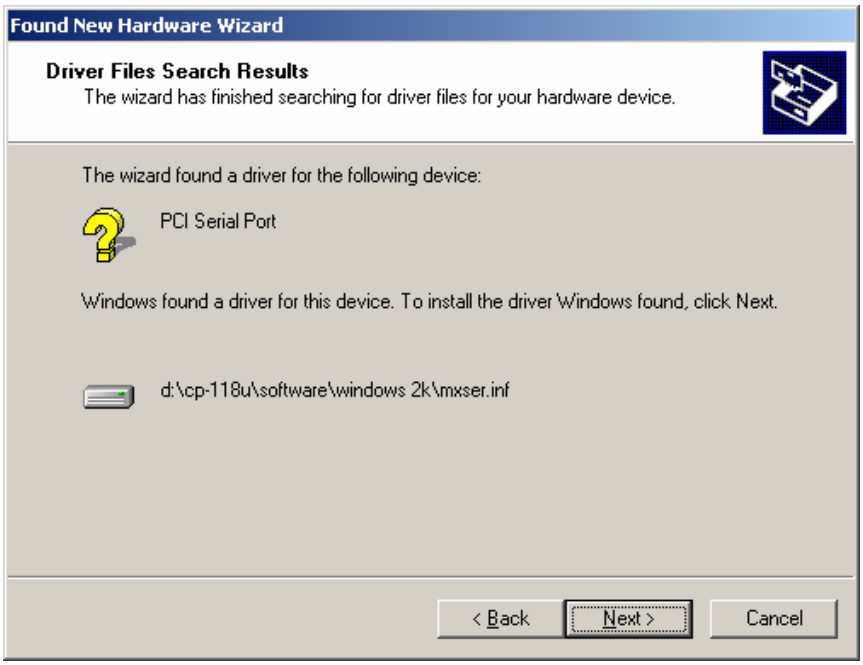
Select **Specify a location** and click **Next** to continue.


Found New Hardware Wizard
Locate Driver Files
Where do you want Windows to search for driver files?
Search for driver files for the following hardware device:
PCI Serial Port
The wizard searches for suitable drivers in its driver database on your computer and in any of the following optional search locations that you specify.
To start the search, click Next. If you are searching on a floppy disk or CD-ROM drive, insert the floppy disk or CD before clicking Next.
Optional search locations:
Floppy disk drives
CD-ROM drives
Specify a location
Microsoft Windows Update
< Back
Next >
Cancel

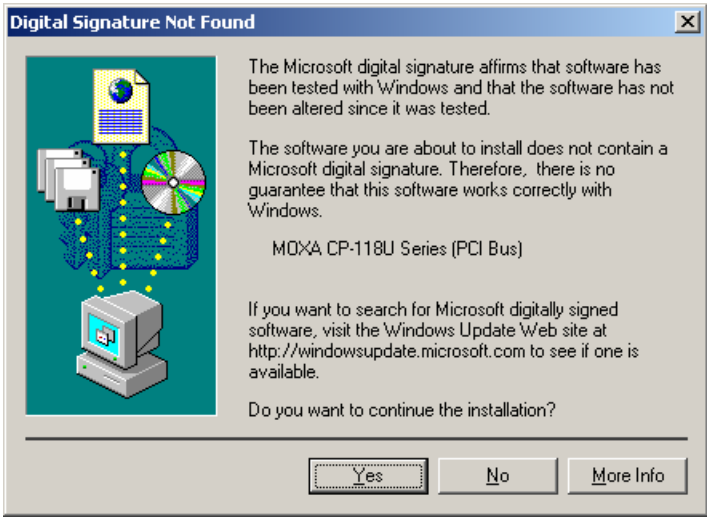
Click **Browse** and select the appropriate directory on the Document & Software CD for the driver. Drivers for all operating systems are located under the product folder in the **\Software** directory (e.g., under \CP-118U Series\Software). Select the **\Windows 2K** folder and click **Next** to continue.



After the wizard has located the driver files, click **Next** to proceed.


Found New Hardware Wizard
Driver Files Search Results
The wizard has finished searching for driver files for your hardware device.
The wizard found a driver for the following device:
PCI Serial Port
Windows found a driver for this device. To install the driver Windows found, click Next.
d:\cp-118u\software\windows 2k\mxser.inf
< Back
Next >
Cancel

If you see a warning that the digital signature has not been found, click **Yes** to proceed.


Digital Signature Not Found
The Microsoft digital signature affirms that software has been tested with Windows and that the software has not been altered since it was tested.
The software you are about to install does not contain a Microsoft digital signature. Therefore, there is no guarantee that this software works correctly with Windows.
MOXA CP-118U Series (PCI Bus)
If you want to search for Microsoft digitally signed software, visit the Windows Update Web site at http://windowsupdate.microsoft.com to see if one is available.
Do you want to continue the installation?
Yes
No
More Info

Windows will install the drivers. When the installation is complete, click **Finish**.

Found New Hardware Wizard
Completing the Found New Hardware Wizard
MOXA CP-118U Series (PCI Bus)
Windows has finished installing the software for this device.
To close this wizard, click Finish.
< Back
Finish
Cancel

Installing the Ports

After the board and drivers have been installed, an installation wizard will guide you through installation of the newly added serial ports, starting with port 0.

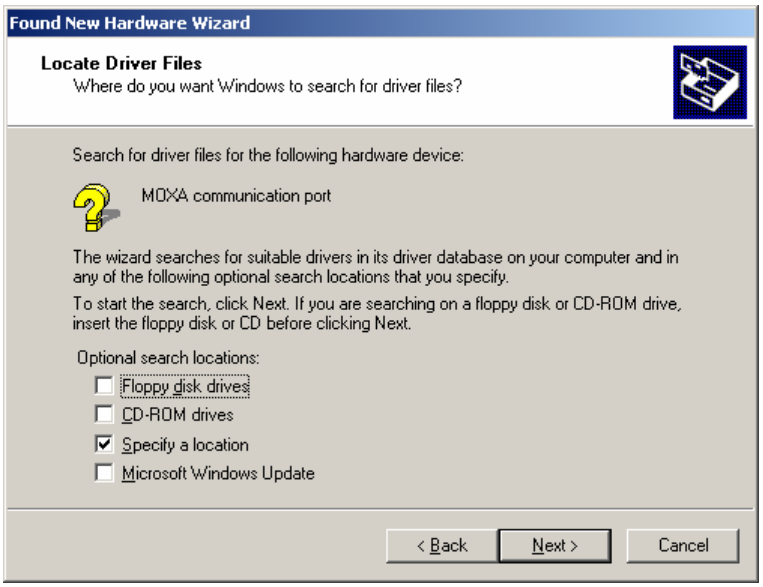
1. When the installation wizard opens, click **Next** to proceed.

Found New Hardware Wizard
Welcome to the Found New Hardware Wizard
This wizard helps you install a device driver for a hardware device.
To continue, click Next.
< Back
Next >
Cancel

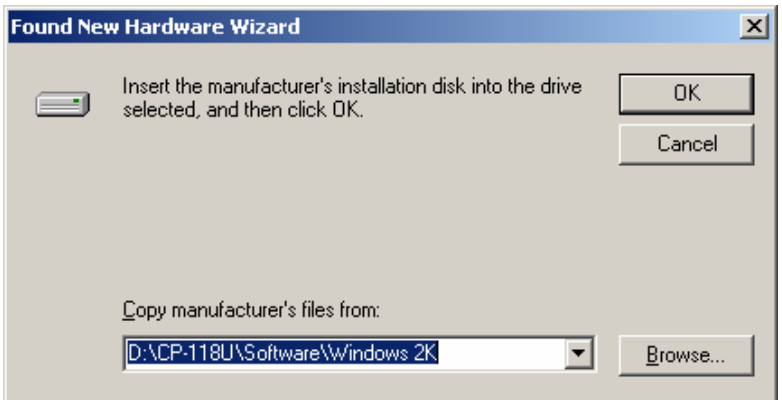
Select **Search for a suitable driver for my device (recommended)** and click **Next** to continue.

Found New Hardware Wizard
Install Hardware Device Drivers
A device driver is a software program that enables a hardware device to work with an operating system.
This wizard will complete the installation for this device:
MOXA communication port
A device driver is a software program that makes a hardware device work. Windows needs driver files for your new device. To locate driver files and complete the installation click Next.
What do you want the wizard to do?
Search for a suitable driver for my device (recommended)
Display a list of the known drivers for this device so that I can choose a specific driver
< Back
Next >
Cancel

Select **Specify a location** and click **Next** to continue.


Found New Hardware Wizard
Locate Driver Files
Where do you want Windows to search for driver files?
Search for driver files for the following hardware device:
MOXA communication port
The wizard searches for suitable drivers in its driver database on your computer and in any of the following optional search locations that you specify.
To start the search, click Next. If you are searching on a floppy disk or CD-ROM drive, insert the floppy disk or CD before clicking Next.
Optional search locations:
Floppy disk drives
CD-ROM drives
Specify a location
Microsoft Windows Update
< Back
Next >
Cancel

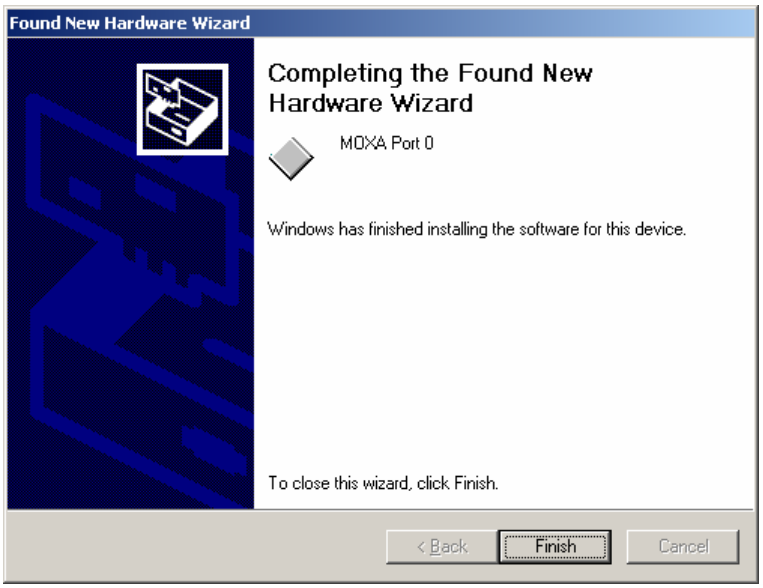
Click **Browse** and select the appropriate directory on the Document & Software CD for the driver. Drivers for all operating systems are located under the product folder in the **\Software** directory (e.g., under \CP-118U Series\Software). Select the **\Windows 2K** folder and click **Next** to continue.



After the wizard has located the driver files, click **Next** to proceed.

Found New Hardware Wizard
Driver Files Search Results
The wizard has finished searching for driver files for your hardware device.
The wizard found a driver for the following device:
MOXA communication port
Windows found a driver for this device. To install the driver Windows found, click Next.
d:\cp-118u\software\windows 2k\mxsport.inf
The wizard also found other drivers that are suitable for this device. To view a list of these drivers or install one of these drivers, select the following check box, and then click Next.
Install one of the other drivers
< Back
Next >
Cancel

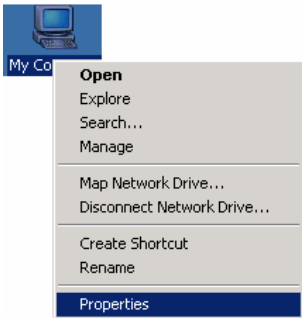
After the drivers have been installed, click **Finish** to exit the wizard. The other serial ports will automatically install in the background.


Found New Hardware Wizard
Completing the Found New Hardware Wizard
MOXA Port 0
Windows has finished installing the software for this device.
To close this wizard, click Finish.
< Back
Finish
Cancel

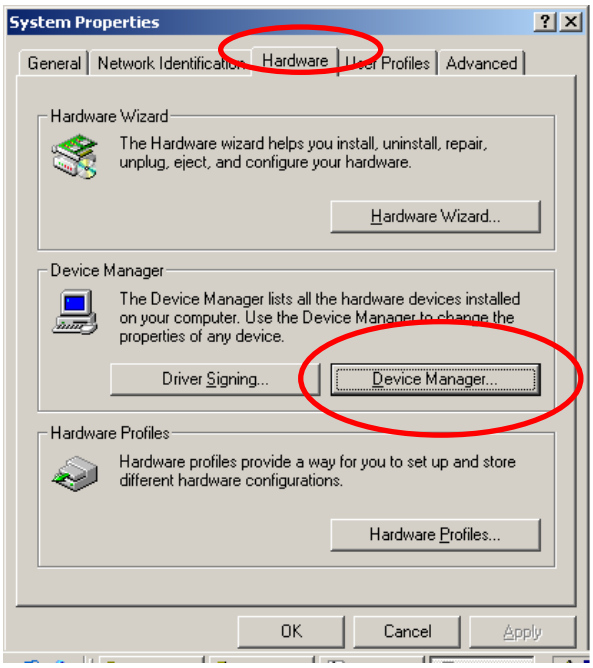
Verifying the Installation

You can use Windows Device Manager to verify proper installation of the board.

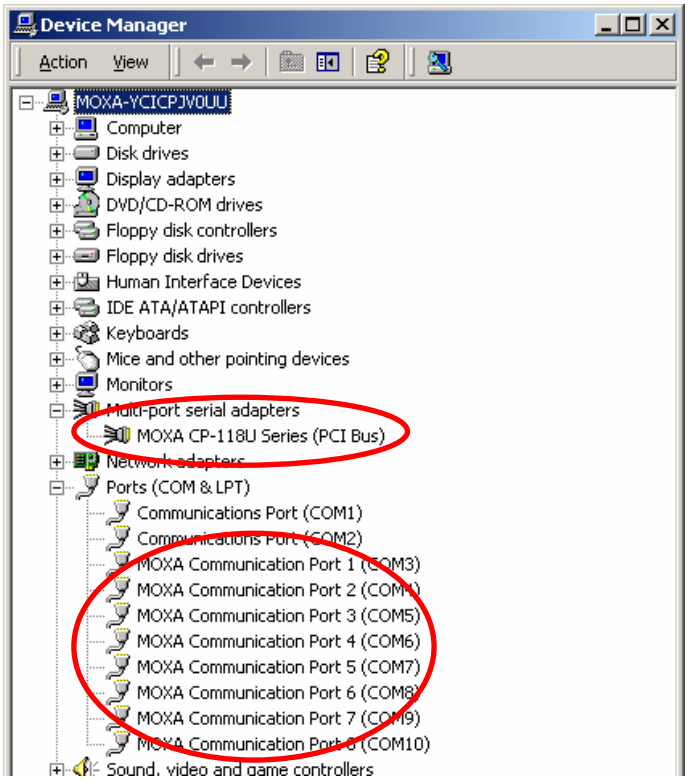
1. Right-click **My Computer** and select **Properties** in the context menu.



In the Hardware tab, click **Device Manager**.


System Properties
General
Network Identification
Hardware
User Profiles
Advanced
Hardware Wizard
The Hardware wizard helps you install, uninstall, repair, unplug, eject, and configure your hardware.
Hardware Wizard...
Device Manager
The Device Manager lists all the hardware devices installed on your computer. Use the Device Manager to change the properties of any device.
Driver Signing...
Device Manager...
Hardware Profiles
Hardware profiles provide a way for you to set up and store different hardware configurations.
Hardware Profiles...
OK
Cancel
Apply

In the **Device Manager** window, you should see your UPCI board under M**ulti-port serial adapters** (CP-118U in this example). You should also see Moxa communication ports under **Ports (COM & LPT)**.

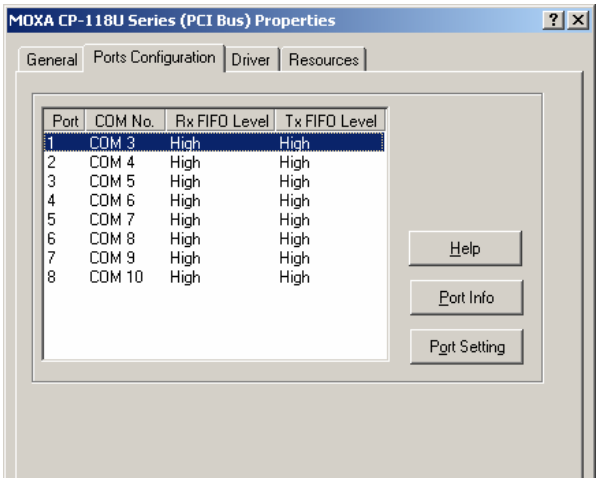


If you see any special marks, such as a question mark or an exclamation mark, next to the Moxa items, the installation of the board was not successful. Examine the Windows event log for details.

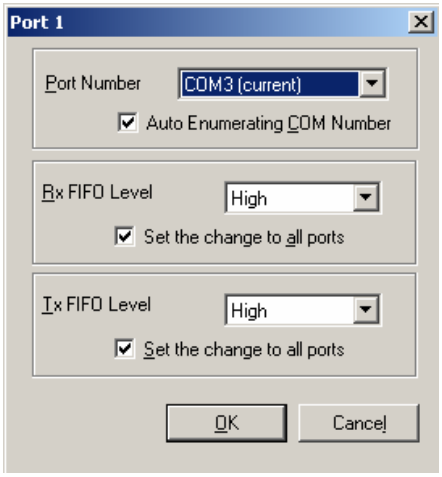
Configuring the Ports

After the board and serial port drivers are installed, the board's **Properties** window will appear. The system will map the ports automatically. You may be prompted to take care of port configuration if other Moxa boards have been installed.

1. On the **Ports Configuration** tab, select a port to configure and click **Port Setting**.



Under **Port Number**, select a COM number to assign to the serial port. Select **Auto Enumerating COM Number** to map subsequent ports in numerical order. For example, if COM 3 is assigned to Port 1, then COM 4 will be automatically assigned to Port 2.



Select an **Rx FIFO Trigger** and **Tx FIFO Size**. The default Rx FIFO Trigger is 120 bytes (high level). The default Tx FIFO Size is 128 bytes (high level). Select **Set the change to all ports** to use this setting for all serial ports on the board.

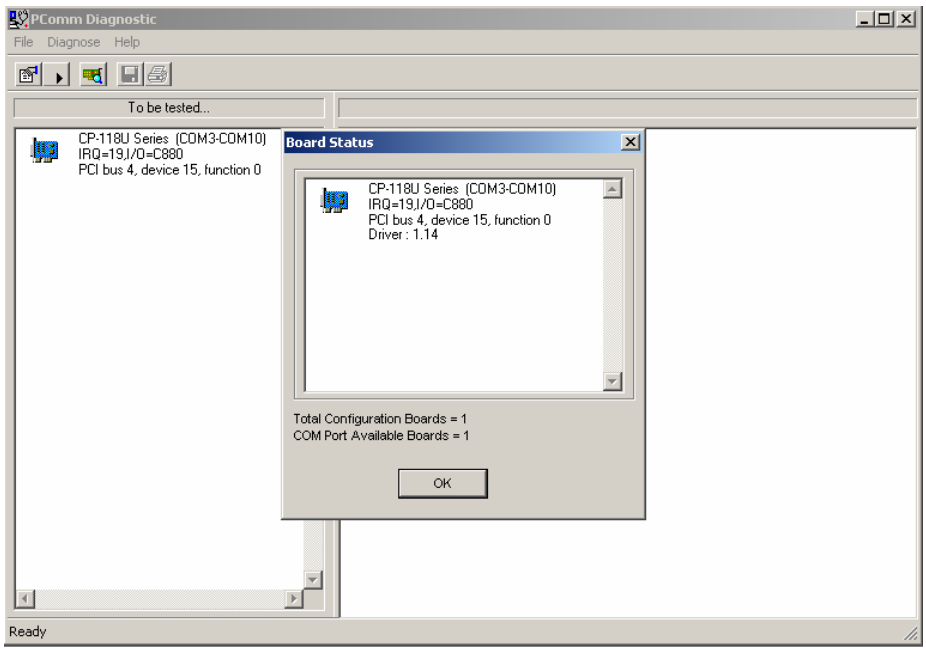
	Tx FIFO	**Rx FIFO**
High	128	120
Middle	64	60
Low	1	1

Click **OK** to approve the settings for the selected port. Continue in the same way to configure the other ports. When you have finished setting up the ports, click **OK** to close the **Properties** window and apply the new port settings.

Using PComm

PComm Diagnostic is a useful program for checking the board's status. It provides internal and external testing of IRQ, TxD/RxD, UART, CTS/RTS, DTR/DSR, and other items. You can use PComm Diagnostic to verify that the module and serial ports are working properly.

You may download PComm from the Moxa website.

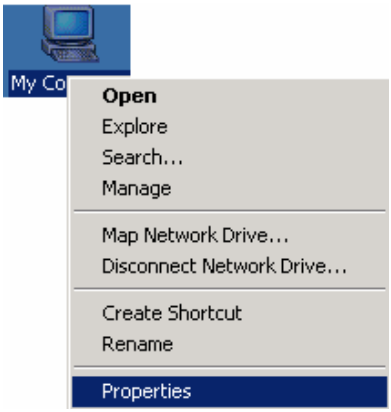


Using Event Log

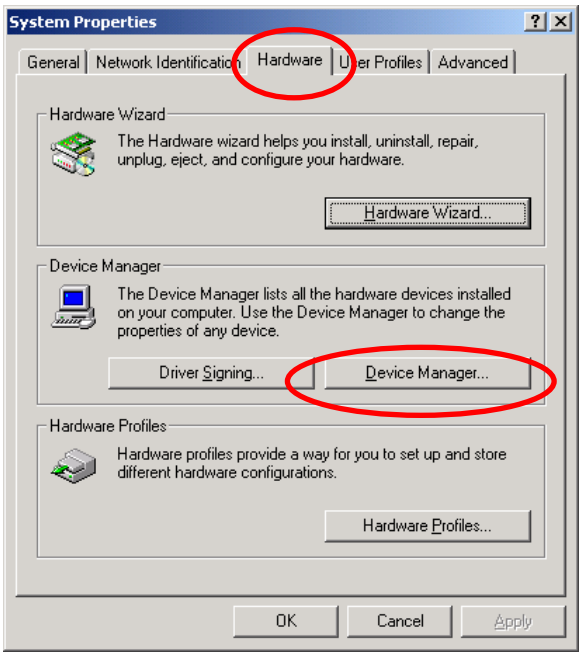
You may refer to the Windows event log to verify operation of the board. To view the event log, open Event Viewer, which is located under Administrative Tools in the Control Panel. Information about the board will be located under the System category.

Disabling the Board

1. Right-click **My Computer** and select **Properties** in the context menu.



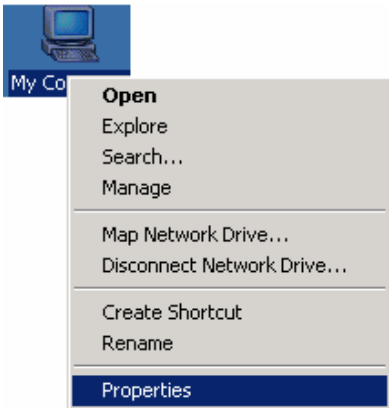
In the **Hardware** tab, click **Device Manager**.


System Properties
General
Network Identification
Hardware
User Profiles
Advanced
Hardware Wizard
The Hardware wizard helps you install, uninstall, repair, unplug, eject, and configure your hardware.
Hardware Wizard...
Device Manager
The Device Manager lists all the hardware devices installed on your computer. Use the Device Manager to change the properties of any device.
Driver Signing...
Device Manager...
Hardware Profiles
Hardware profiles provide a way for you to set up and store different hardware configurations.
Hardware Profiles...
OK
Cancel
Apply

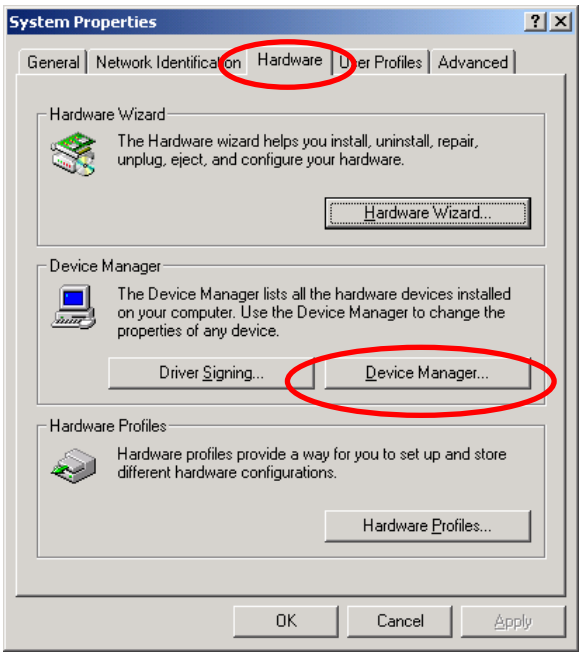
In **Device Manager**, right-click the UPCI board under **Multi-port serial adapters** and select **Disable** in the context menu. This will disable the board.

Uninstalling the Board

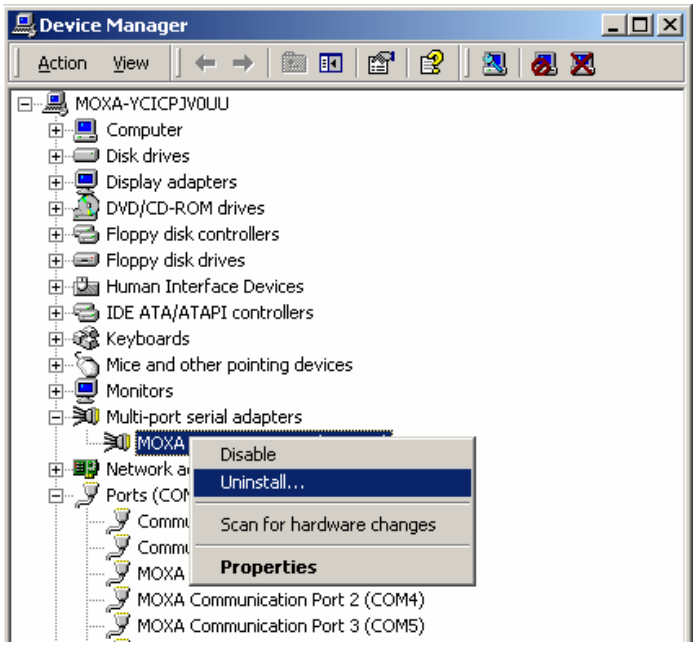
1. Right-click **My Computer** and select **Properties** in the context menu.



In the **Hardware** tab, click **Device Manager**.


System Properties
General
Network Identification
Hardware
User Profiles
Advanced
Hardware Wizard
The Hardware wizard helps you install, uninstall, repair, unplug, eject, and configure your hardware.
Hardware Wizard...
Device Manager
The Device Manager lists all the hardware devices installed on your computer. Use the Device Manager to change the properties of any device.
Driver Signing...
Device Manager...
Hardware Profiles
Hardware profiles provide a way for you to set up and store different hardware configurations.
Hardware Profiles...
OK
Cancel
Apply

Right-click the UPCI board under **Multi-port serial adapters** (CP-118U in this example) and select **Uninstall** in the context menu.



At the warning prompt, click **OK** to uninstall the device.

6
Driver Installation: Windows NT

The following topics are covered in this chapter:

- **Overview**
- **Installing the Driver**
- **Configuring the Ports**
- **Removing the Board**
- **Updating the Driver**
- **Removing the Driver**

Overview

This chapter explains how to install, configure, update, and remove the board drivers for Windows NT. The following models are supported:

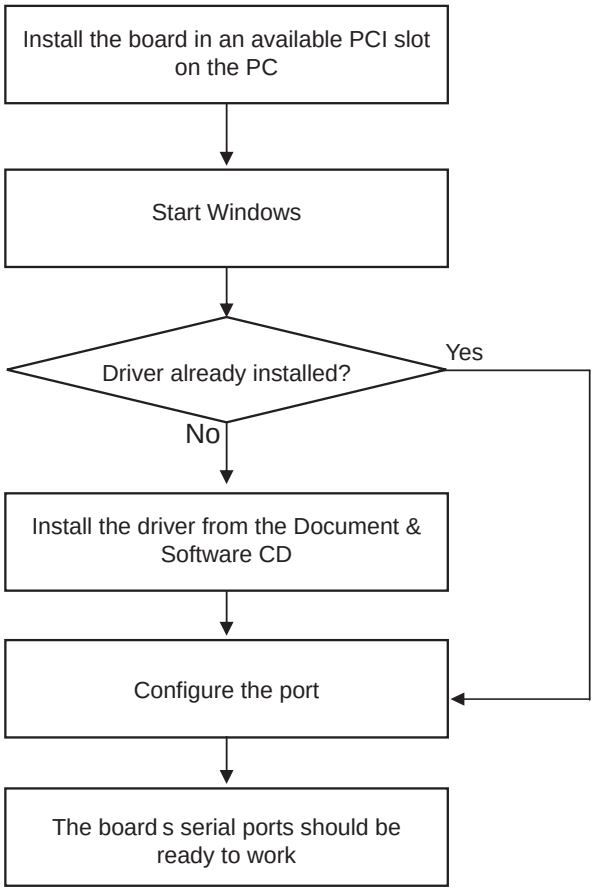
2 Ports	4 Ports	8 Ports
CP-112UL/ CP-112UL-I	CP-114UL / CP-114UL-I	CP-118U / CP-118U-I
CP-132UL / CP-132UL-I	CP-134U / CP-134U-I	CP-138U / CP-138U-I
CP-102UL	CP-104UL	CP-168U
CP-102U	CP-104JU	
CP-102UF	POS-104UL	

Windows NT supports up to 256 serial ports, from COM1 to COM256. Moxa developed pure 32-bit Windows device drivers in order to fully utilize the advanced multi-process and multi-thread features of Windows NT. The drivers conform to the Win32 COMM API standard.

You can download the drivers from the Moxa website. For information on developing your own serial programming applications, please refer to Chapter 9.

Before installing the software, be sure to install the hardware first. For details on installing the hardware, please refer to Chapter 2.

The overall procedure for installing the drivers is shown on the right. Windows NT will not automatically detect a newly installed board. You will need to manually add the board in the operating system.


Install the board in an available PCI slot on the PC
Start Windows
Driver already installed?
Yes
No
Install the driver from the Document & Software CD
Configure the port
The board s serial ports should be ready to work

Installing the Driver

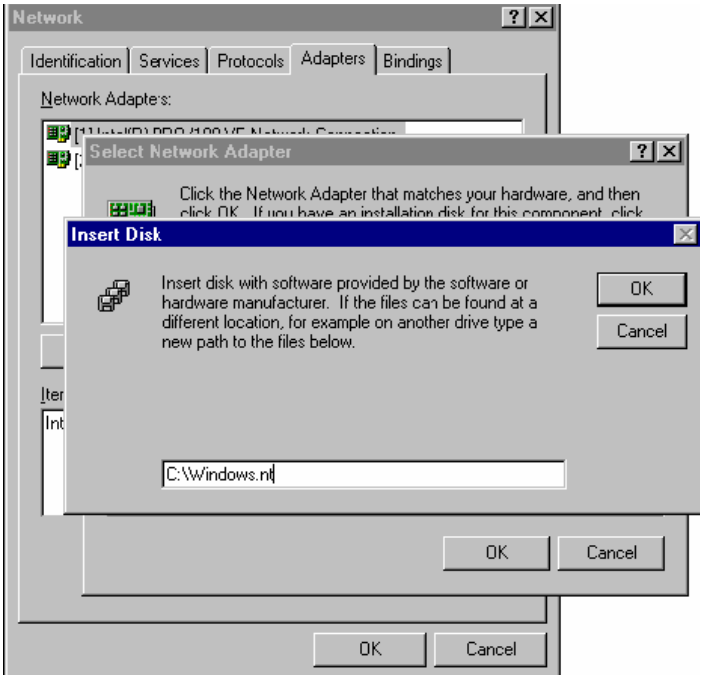
You will need to plug the board in an available PCI or PCI-X slot first, before installing the driver. Note that these instructions use the CP-168U as an example. The procedure for installing all models is the same.

1. Log into Windows NT as Administrator.

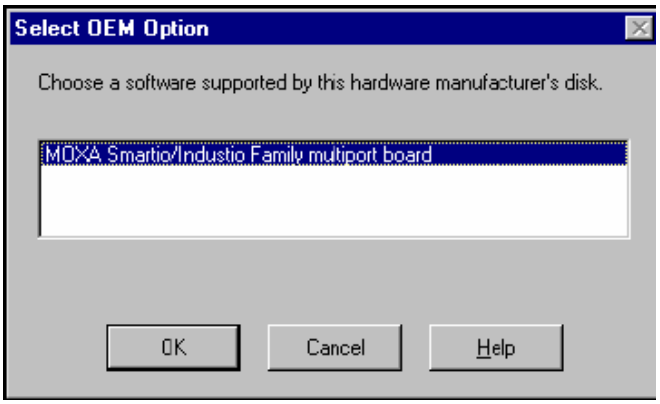
   Locate the appropriate folder for your board's drivers on the Document & Software CD. The NT drivers will be located under the product folder in the **\Software\WinNT** directory (e.g., under \CP-118U Series\Software). Copy this folder to the PC's hard disk and remember its location.

   In the **Control Panel**, open **Network** applet. On the **Adapters** tab, click **Add**. When prompted to select a product, click **Have Disk…**

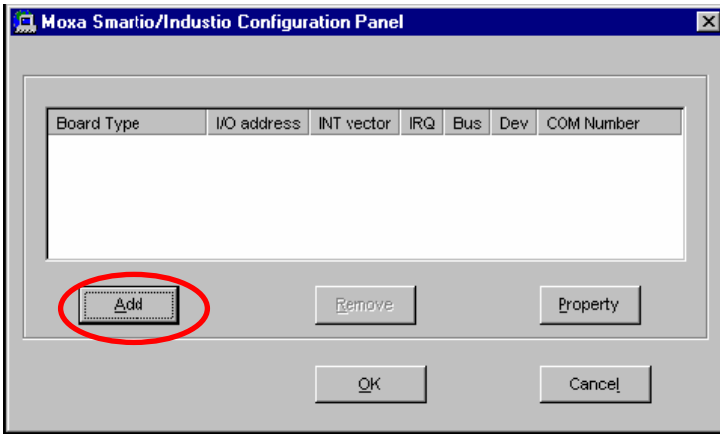
   You will be prompted to enter the path to the driver. Enter the location of the drivers that you copied from the Document & Software CD (**C:\Windows.nt** in this example) and then click **OK**.



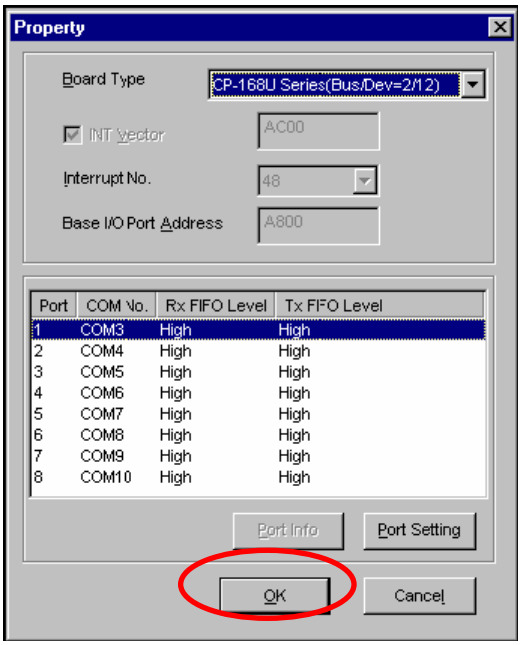
When prompted, select your board model (**Smartio/Industio Family multiport board** in this example) and click **OK**.



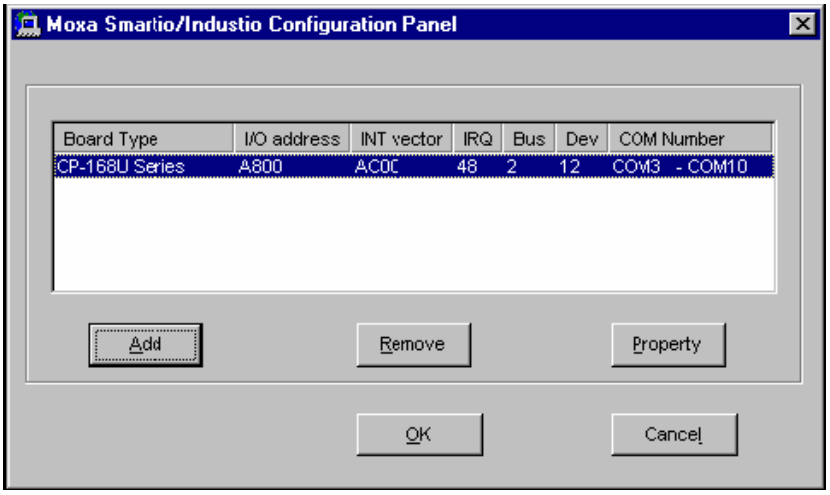
After the files have been installed, a configuration panel will open. This is where boards are installed, configured, and removed. If another board has already been installed on the system, it will already be listed. Windows NT does not automatically detect Moxa UPCI boards, so you will need to click **Add** for a newly installed board.



Under **Board Type**, select the UPCI board that is being installed. The window will show the COM settings for the serial ports on the board. You can modify the COM settings for any port at this time by selecting a port and clicking **Port Setting**. If you are satisfied with the COM settings, click **OK** to return to the configuration panel.



The board will now appear in the configuration panel (**CP-168U Series in this example**). Click **OK** to return to the Network applet. After that, click **OK** again to exit the Network applet



Restart the PC. After you have logged back into Windows NT, you may check the event log issued by the Moxa driver to see if the board's ports have been initialized successfully. In the **Administrative** group, open **Event Viewer** and select **Log and System**. For each newly installed or configured Moxa UPCI board, check for a message stating that the board has been enabled (e.g., "Moxa CP-168U board, with first serial port COM3, has been enabled").

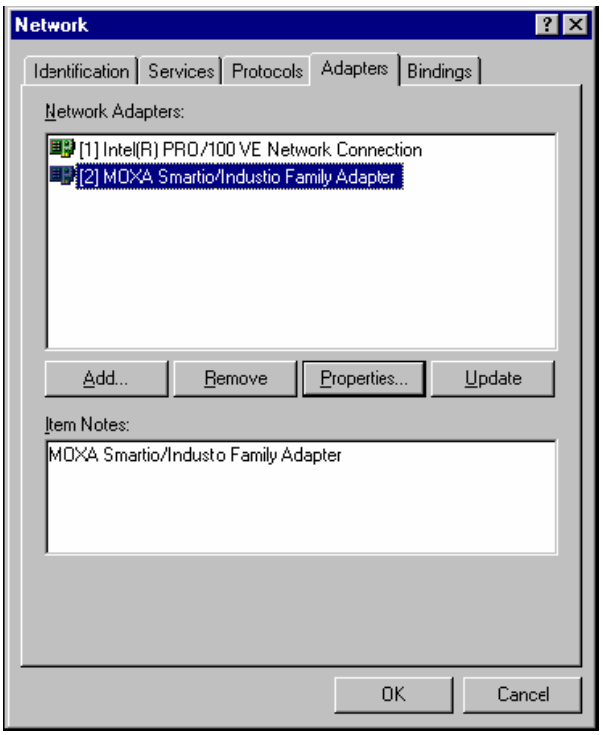
ATTENTION

The driver configuration will NOT take effect until you restart the PC.

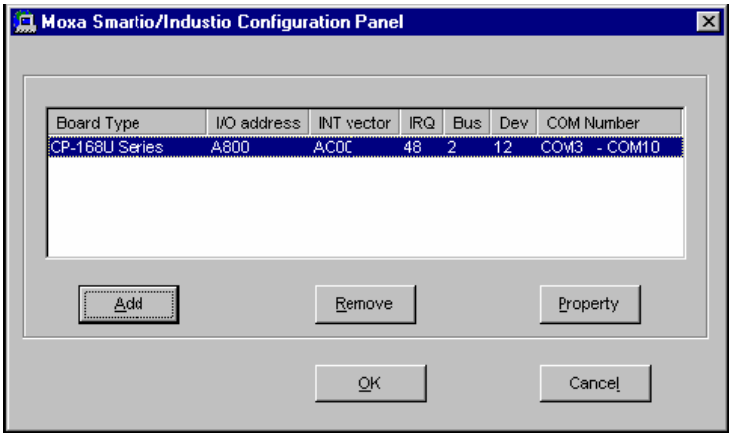
Double check that all CP-168U board components are connected and fastened tightly to ensure that the system and the driver can start up successfully.

Configuring the Ports

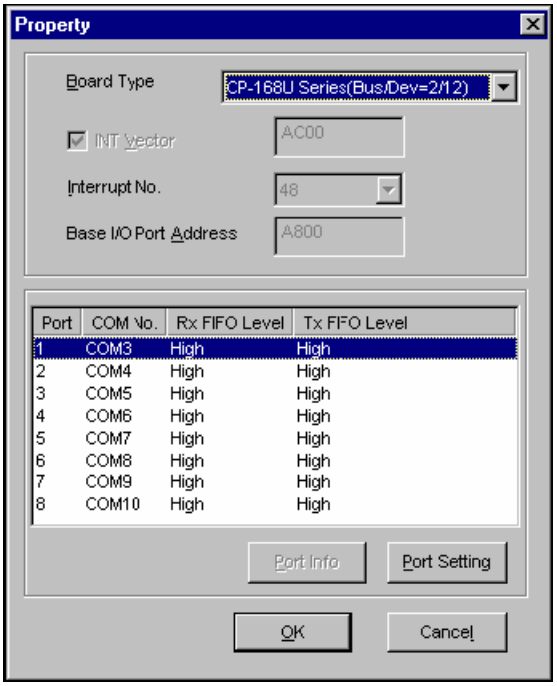
1. In Windows **Control Panel**, open the **Network** applet. In the **Adapters** tab, UPCI boards will appear as a type of Moxa adapter (**Moxa Smartio/Industio Family Adapter** in this example). Select the Moxa adapter and click **Properties…**



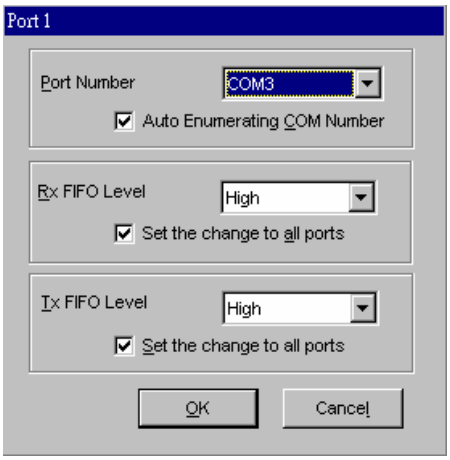
The configuration panel will open with a list of installed boards. Select your board and click **Property**. Up to 4 Moxa UPCI boards can be installed at a time.



Select a port to configure and click **Port Setting**.



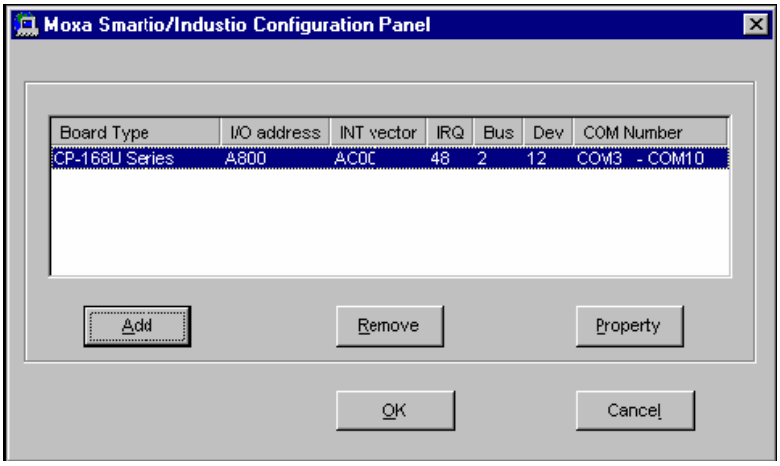
Under **Port Number**, select a COM number to assign to the serial port. Select **Auto Enumerating COM Number** to map subsequent ports in numerical order. For example, if COM 3 is assigned to Port 1, then COM 4 will be automatically assigned to Port 2.



Select an **Rx FIFO Trigger** and **Tx FIFO Size**. The default Rx FIFO Trigger is 120 bytes (high level). The default Tx FIFO Size is 128 bytes (high level). Select **Set the change to all ports** to use this setting for all serial ports on the board.

	Tx FIFO	**Rx FIFO**
High	128	120
Middle	64	60
Low	1	1

Click **OK** to approve the settings for the selected port. Continue in the same way to configure the other ports. When you have finished setting up the ports, click **OK** to close the **Properties** window and apply the new port settings. Click **OK** again to exit the Network applet.

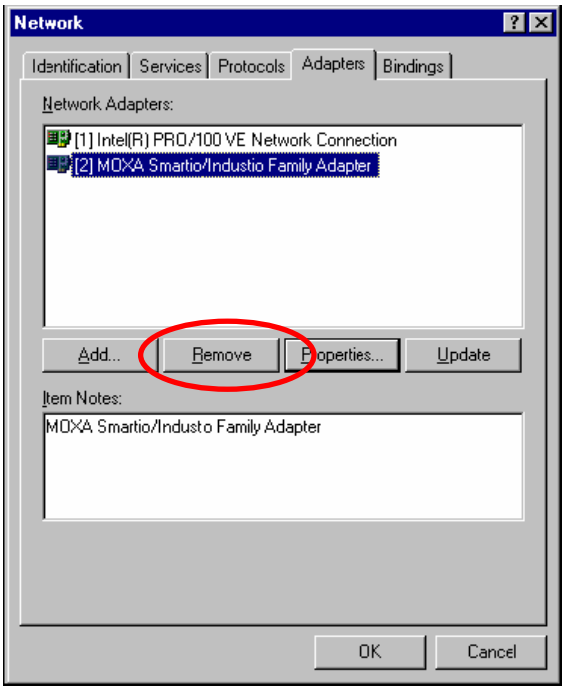


Removing the Board

To remove a board, shut of your PC and physically remove the board from the PCI slot. The next time you start up the PC, Windows NT will automatically remove the configuration. You do not need to go through the Windows control panel.

Updating the Driver

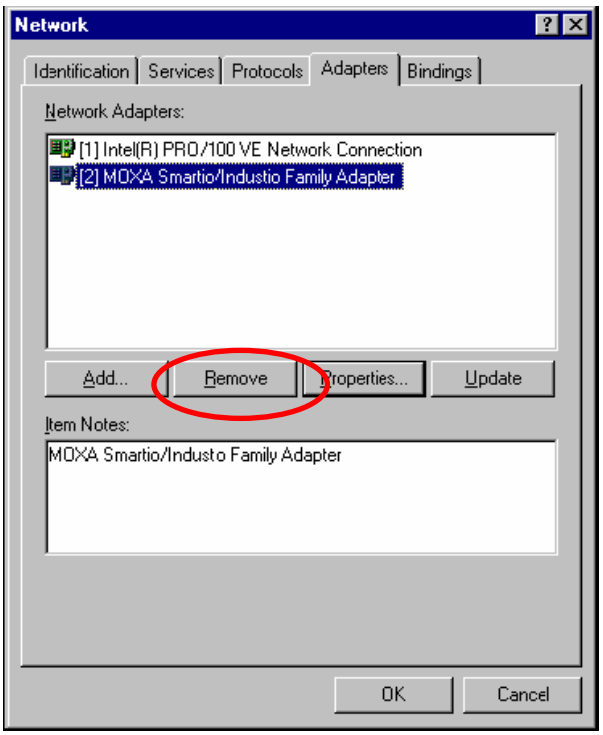
1. In Windows **Control Panel**, open the **Network** applet. In the **Adapters** tab, UPCI boards will appear as a type of Moxa adapter (**Moxa Smartio/Industio Family Adapter** in this example). Select the Moxa adapter and click **Remove**.



Restart the system. Go through the process of installing the drivers using the new drivers.

Removing the Driver

1. In Windows **Control Panel**, open the **Network** applet. In the **Adapters** tab, UPCI boards will appear as a type of Moxa adapter (**Moxa Smartio/Industio Family Adapter** in this example). Select the Moxa adapter and click **Remove**.



Click **OK** to exit the Network applet and restart the system.

7

Driver Installation: Windows 95/98/ME

The following topics are covered in this chapter:

- **Overview**
- **Installing the Driver**
  - Windows 95
  - Windows 98 and ME
- **Configuring the Ports**
- **Updating the Driver**
- **Removing the Driver**

Overview

This chapter explains how to install, configure, update, and remove the board drivers for Windows 95/98/ME. The following models are supported:

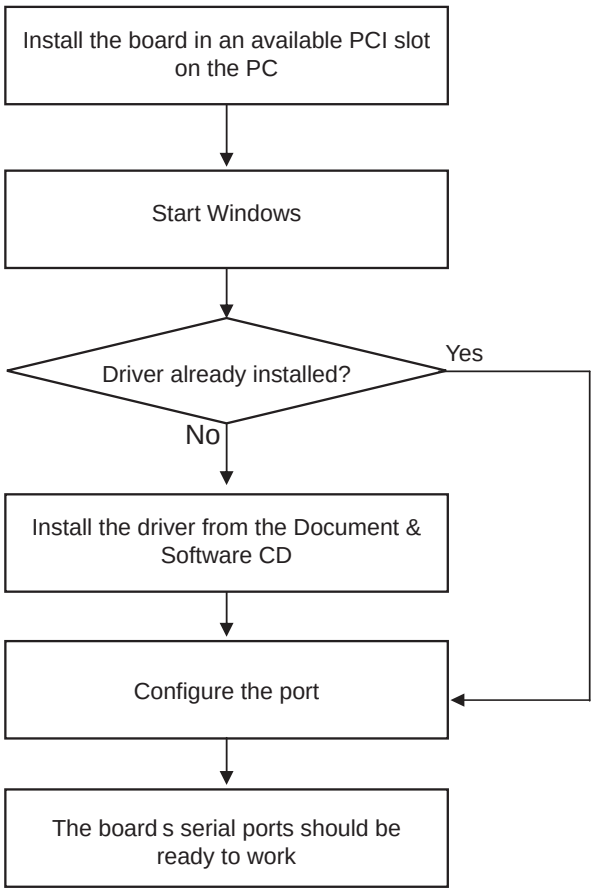
2 Ports	4 Ports	8 Ports
CP-112UL/ CP-112UL-I	CP-114UL / CP-114UL-I	CP-118U / CP-118U-I
CP-132UL / CP-132UL-I	CP-134U / CP-134U-I	CP-138U / CP-138U-I
CP-102UL	CP-104UL	CP-168U
CP-102U	CP-104JU	
CP-102UF	POS-104UL	

Windows 95/98/ME supports up to 128 serial ports, from COM1 to COM128. In order to fully utilize the advanced multi-process and multi-thread features of Windows 95/98/ME, Moxa developed pure 32-bit virtual device port drivers (VxD) that are compliant with communication drivers (VCOMM). The drivers conform to the Win32 COMM API standard.

You can download the drivers from the Moxa website. For information on developing your own serial programming applications, please refer to Chapter 9.

Before installing the software, be sure to install the hardware first. For details on installing the hardware, please refer to Chapter 2.

The overall procedure for installing the drivers is shown on the right. A newly installed board will be automatically detected by the operating system.


Install the board in an available PCI slot on the PC
Start Windows
Driver already installed?
Yes
No
Install the driver from the Document & Software CD
Configure the port
The board s serial ports should be ready to work

Installing the Driver

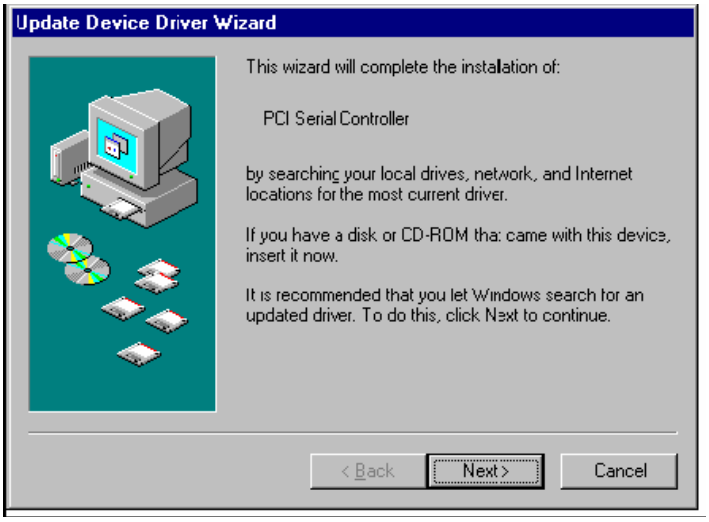
The following instructions show how to install the driver for the first time under Windows 95/98/ME. You will need to plug the board in an available PCI or PCI-X slot first, before installing the driver.

ATTENTION

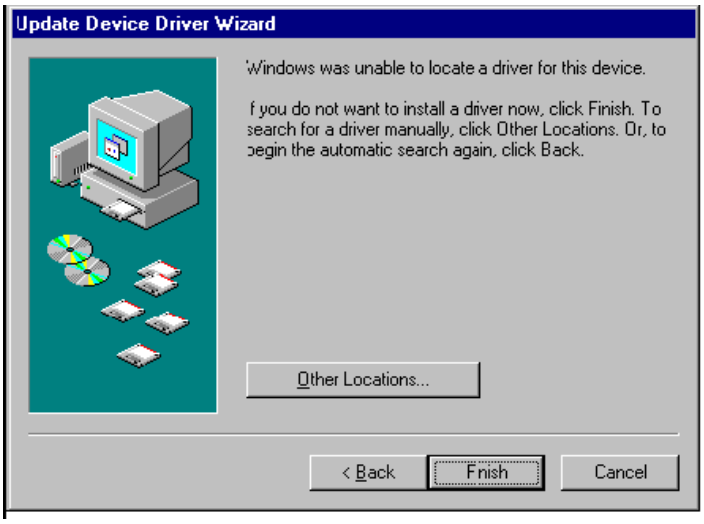
The following steps will not be necessary if a Moxa UPCI board was already installed on your computer. Windows will automatically detect and install any additional board(s) at bootup. In this case, you may proceed directly to configuring the ports.

Windows 95

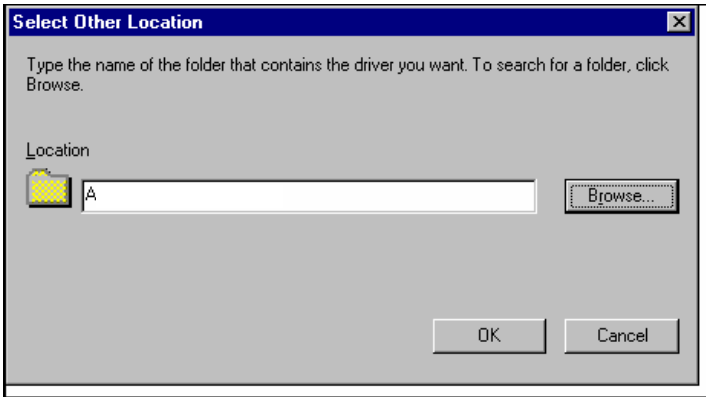
1. After the board is physically installed and the PC boots up, Windows will automatically detect the new board and the Found New Hardware Wizard window will open. Click **Next** to continue.


Update Device Driver Wizard
This wizard will complete the installation of:
PCI Serial Controller
by searching your local drives, network, and Internet locations for the most current driver.
If you have a disk or CD-ROM that came with this device, insert it now.
It is recommended that you let Windows search for an updated driver. To do this, click Next to continue.
< Back
Next >
Cancel

Select **Other Locations…**


Update Device Driver Wizard
Windows was unable to locate a driver for this device.
If you do not want to install a driver now, click Finish. To search for a driver manually, click Other Locations. Or, to begin the automatic search again, click Back.
Other Locations...
< Back
Finish
Cancel

Click **Browse** and select the appropriate directory on the Document & Software CD for the driver. Drivers for all operating systems are located under the product folder in the **\Software** directory (e.g., under \CP-168U \Software). Select the **\Win9x** folder and click **OK** to continue.



After Windows finds the drivers, click **Finish**.

Add New Hardware Wizard
Windows driver file search for the device:
CP-168U Series
If you want to use this driver, click Finish. If this is not the correct driver and you want to search for a different driver manually, click Other Locations.
Location of Driver
Windows.95
Other Locations...
< Back
Finish
Cancel

You may begin configuring and using the new COM ports right away without restarting Windows.

Windows 98 and ME

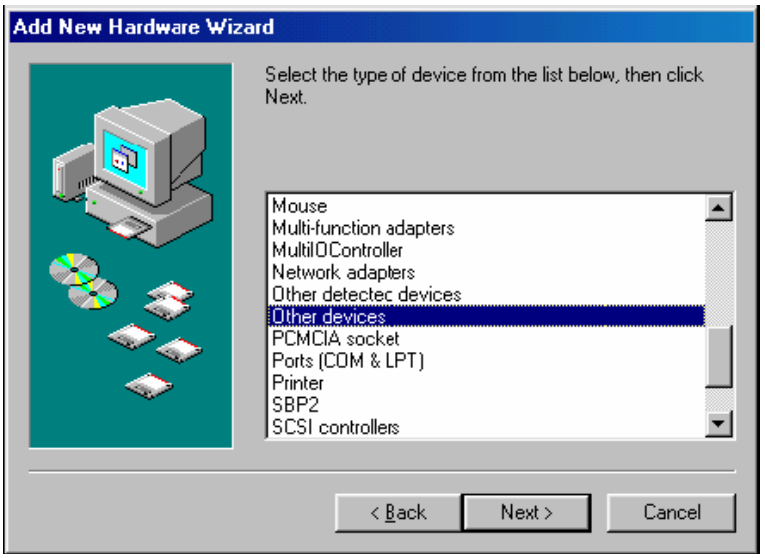
1. After the board is physically installed and the PC boots up, Windows will automatically detect the new board and the Found New Hardware Wizard window will open. Click **Next** to continue.

Add New Hardware Wizard
This wizard searches for new drivers for:
PCI Serial Controller
A device driver is a software program that makes a hardware device work.
< Back
Next >
Cancel

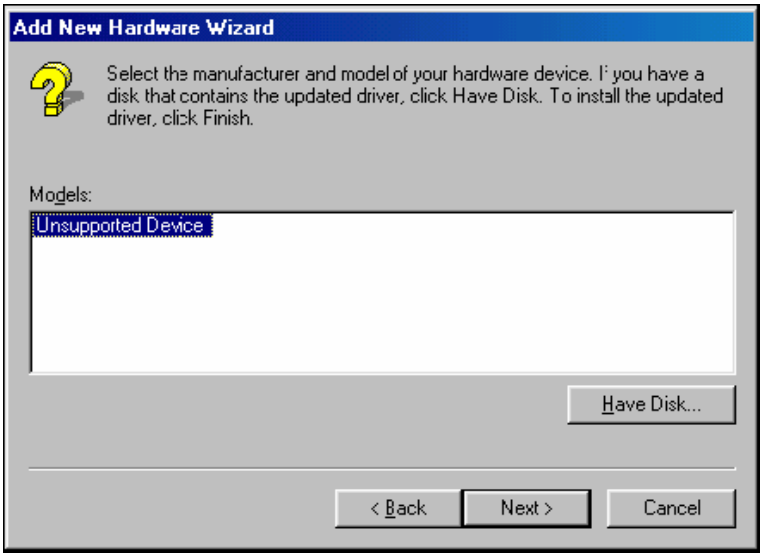
Select **Display a list...** and click **Next**.

Add New Hardware Wizard
What do you want Windows to do?
Search for the best driver for your device. (Recommended).
Display a list of all the drivers in a specific location, so you can select the driver you want.
< Back
Next >
Cancel

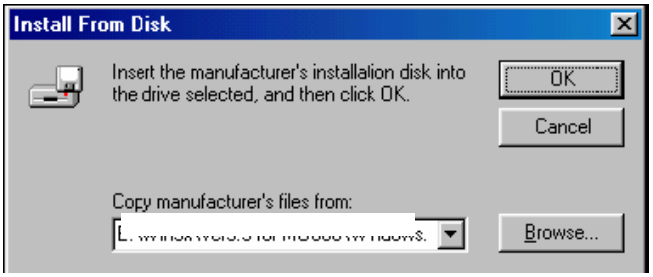
Select **Other Devices** and click **Next**.



Select **Have Disk…**


Add New Hardware Wizard
Select the manufacturer and model of your hardware device. If you have a disk that contains the updated driver, click Have Disk. To install the updated driver, click Finish.
Models:
Unsupported Device
Have Disk...
< Back
Next >
Cancel

Click **Browse** and select the appropriate directory on the Document & Software CD for the driver. Drivers for all operating systems are located under the product folder in the **\Software** directory (e.g., under \CP-168U \Software). Select the **\Win9x** folder and click **OK** to continue.



After Windows installs the drivers, click **Finish**.

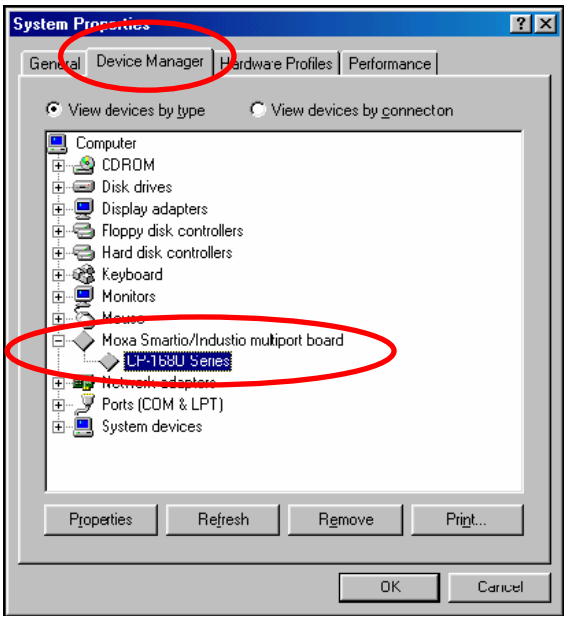
Add New Hardware Wizard
CP-168U Series
Windows has finished installing the software you selected that your new hardware device requires.
< Back
Finish
Cancel

Configuring the Ports

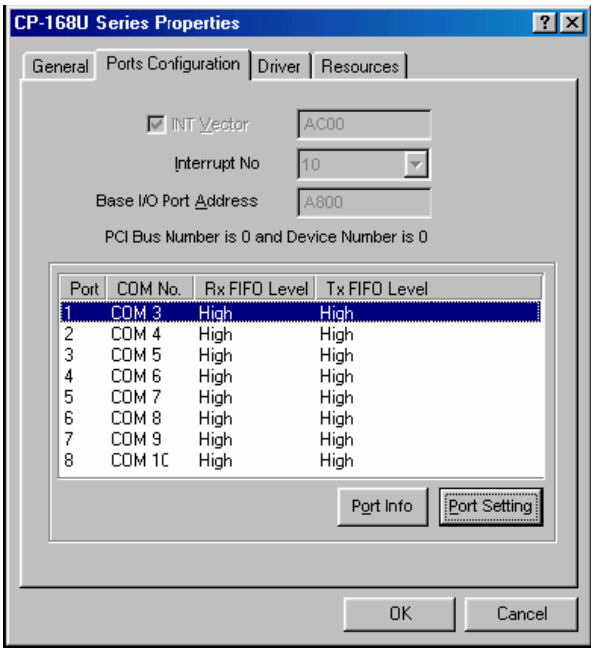
You may configure the COM ports after the board and drivers have been installed.

1. In the Windows **Control Panel**, open the **System** applet.

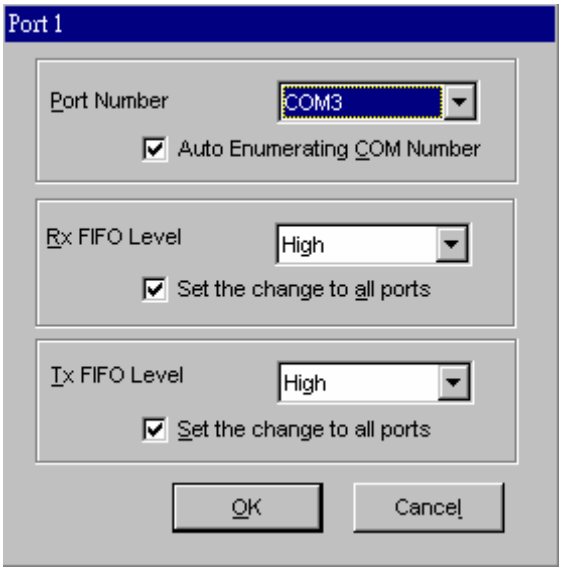
In the **Device Manager** tab, expand the **Moxa Smartio/Industio multiport board** category by clicking the "+" sign next to it. Select the desired board (CP-168U in this example) and click **Properties**.



2. On the **Ports Configuration** tab, select a port to configure and click **Port Setting**.



Under **Port Number**, select a COM number to assign to the serial port. Select **Auto Enumerating COM Number** to map subsequent ports in numerical order. For example, if COM 3 is assigned to Port 1, then COM 4 will be automatically assigned to Port 2.



Select an **Rx FIFO Trigger** and **Tx FIFO Size**. The default Rx FIFO Trigger is 120 bytes (high level). The default Tx FIFO Size is 128 bytes (high level). Select **Set the change to all ports** to use this setting for all serial ports on the board.

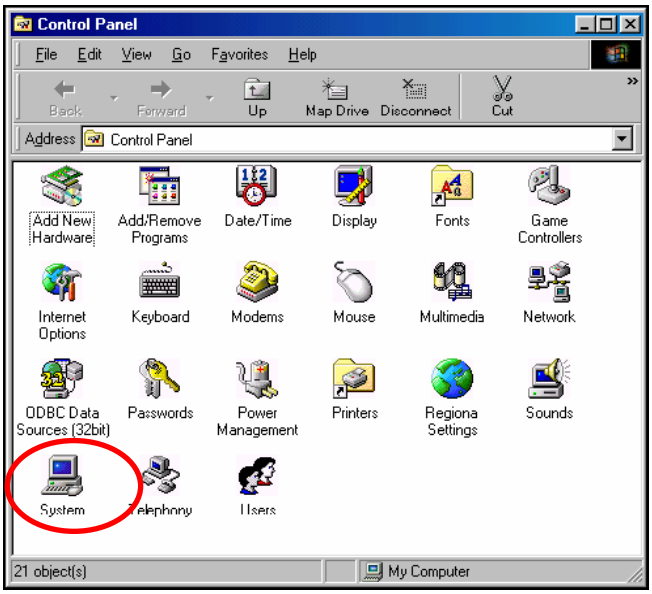
	Tx FIFO	**Rx FIFO**
High	128	120
Middle	64	60
Low	1	1

Click **OK** to approve the settings for the selected port. Continue in the same way to configure the other ports. When you have finished setting up the ports, click **OK** to close the **Properties** window and apply the new port settings. Click **OK** again to close the **Device Manager** and restart the system.

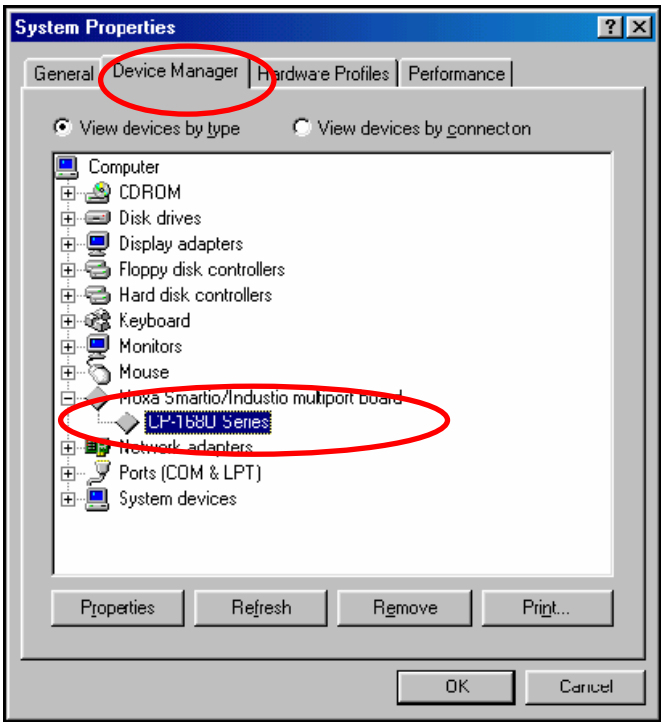
Updating the Driver

You may configure the COM ports after the board and drivers have been installed.

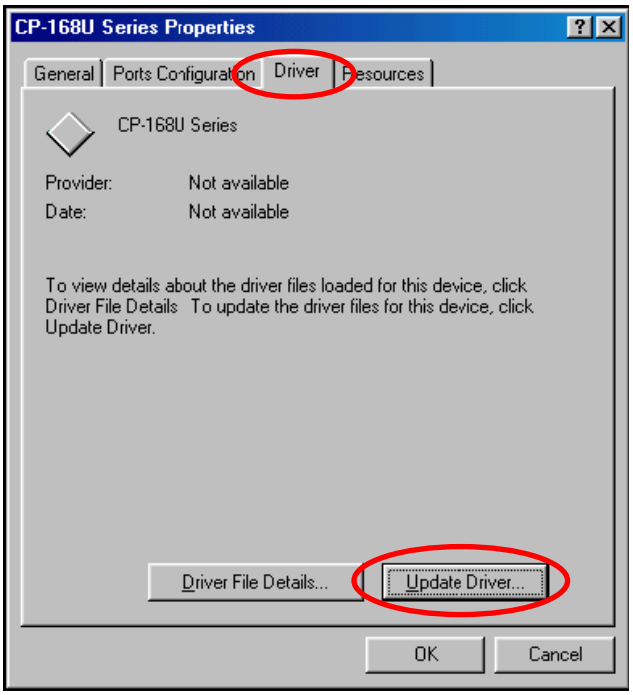
1. In the Windows **Control Panel**, open the **System** applet.



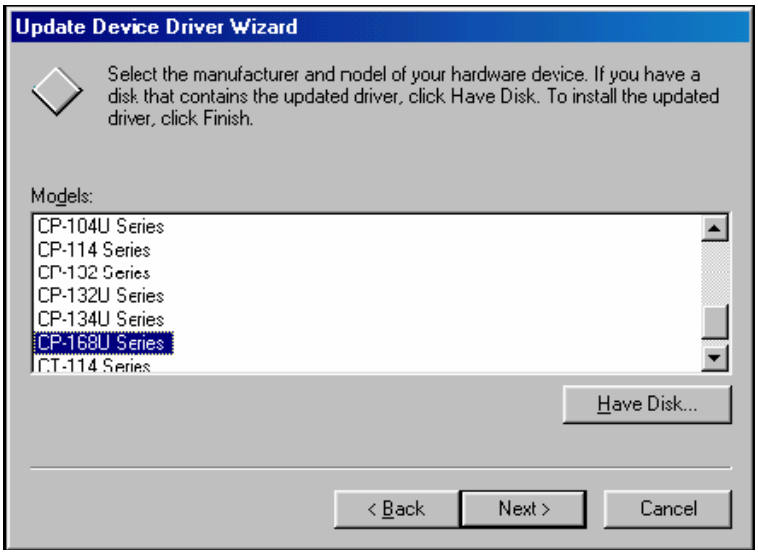
In the **Device Manager** tab, expand the **Moxa Smartio/Industio multiport board** category by clicking the "+" sign next to it. Select the desired board (CP-168U in this example) and click **Properties**.



In the **Driver** tab, click **Update Driver....**



Select the appropriate model (CP-168U in this example) and click **Have Disk...**.

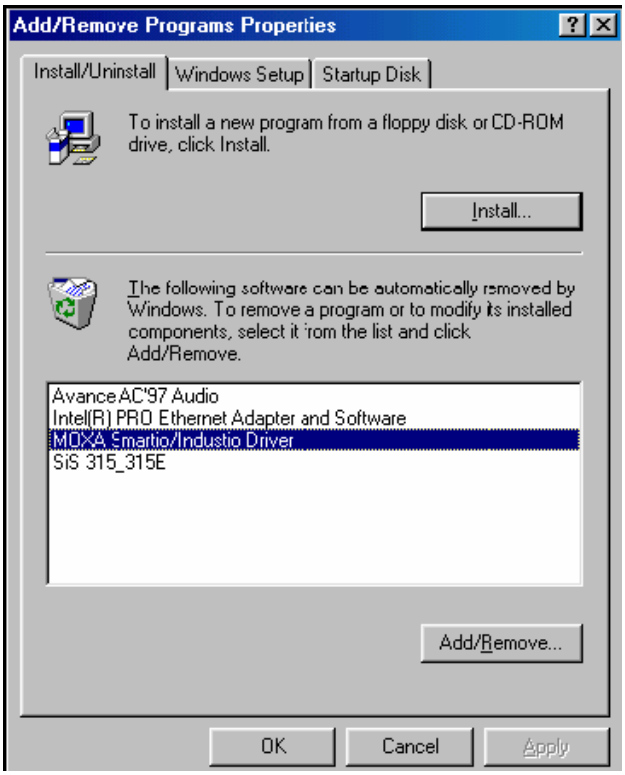

Update Device Driver Wizard
Select the manufacturer and model of your hardware device. If you have a disk that contains the updated driver, click Have Disk. To install the updated driver, click Finish.
Models:
CP-104U Series
CP-114 Series
CP-132 Series
CP-132U Series
CP-134U Series
CP-168U Series
Have Disk...
< Back
Next >
Cancel

When prompted, select the appropriate directory on the Document & Software CD for the driver. Drivers for all operating systems are located under the product folder in the **\Software** directory (e.g., under \CP-118U Series\Software). Select the **\Win9x** folder and click **OK** to continue.

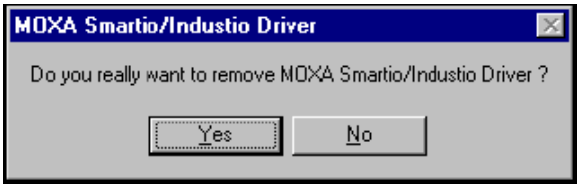
You will be prompted to restart the system. The new drivers will be in effect the next time you restart.

Removing the Driver

1. In the Windows Control Panel, open the **Add/Remove Programs** applet. On the Install/Uninstall tab, select **Moxa Smartio/Industio Driver** and click **Add/Remove**.


Add/Remove Programs Properties
Install/Uninstall
Windows Setup
Startup Disk
To install a new program from a floppy disk or CD-ROM drive, click Install.
Install...
The following software can be automatically removed by Windows. To remove a program or to modify its installed components, select it from the list and click Add/Remove.
Avance AC'97 Audio
Intel(R) PRO Ethernet Adapter and Software
MOXA Smartio/Industio Driver
SiS 315_315E
Add/Remove...
OK
Cancel
Apply

When prompted, click **Yes** to confirm that you want to remove the driver.



After the driver has been removed, click **OK** to return to the **Add/Remove Programs** applet.

8
Driver Installation: Windows CE

The following topics are covered in this chapter:

- **Windows CE 5.0**
  - Installing the Driver
- **Windows CE 6.0 Installation**

Windows CE 5.0

In this section, we explain how to install Moxa Universal PCI boards under WinCE 5.0. These instructions are intended for users who are familiar with the Windows CE Platform Builder 5.0 Toolkit, and would like to install one or more Moxa Tech products. Here, we only give the step-by-step installation instructions for the development environment. You will need to download the image file to the target host yourself.

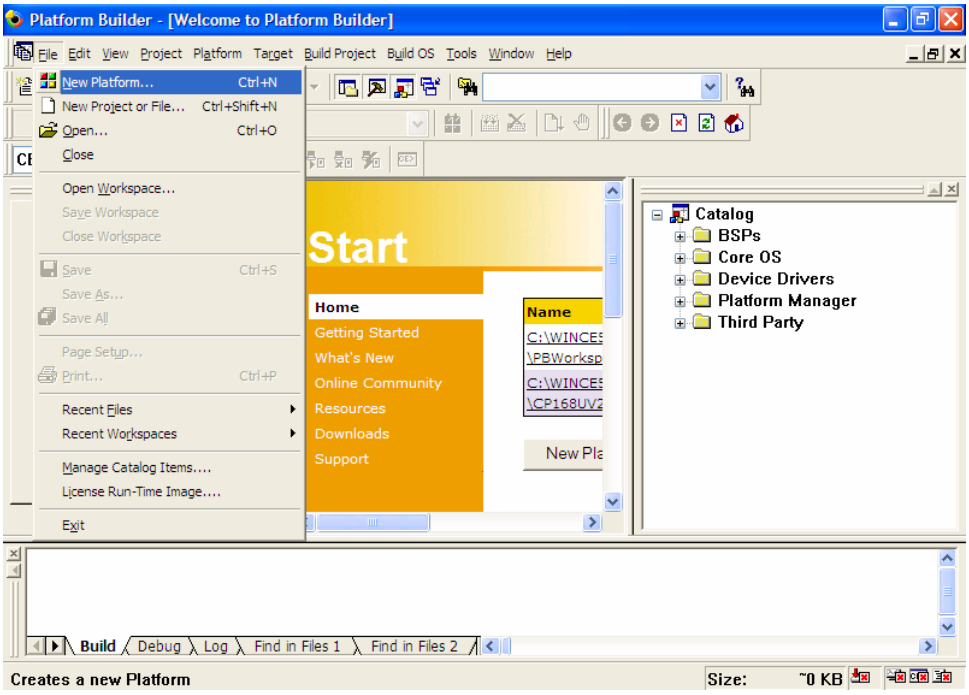
The CP-104UL board is used to illustrate the installation procedure.

Installing the Driver

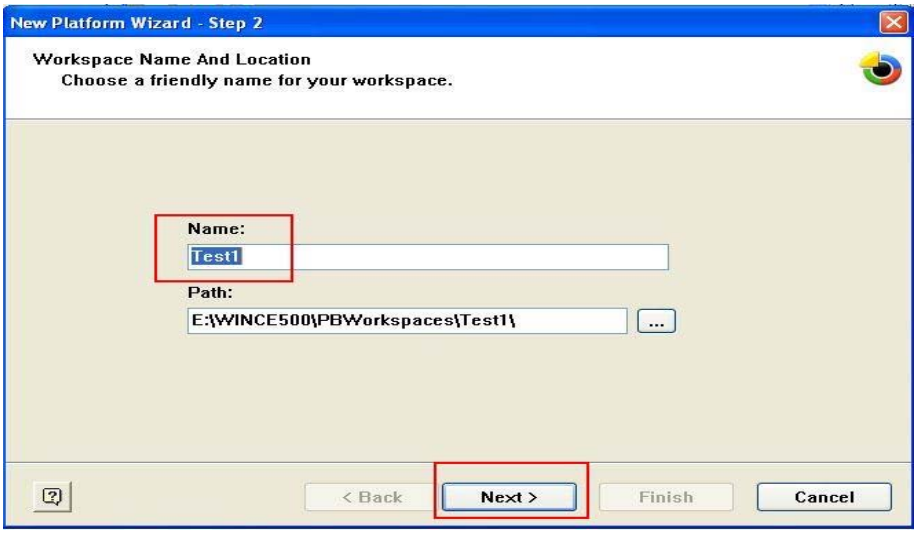
The following procedure explains how to install the CP-104UL multiport serial module driver under WinCE.

Obtain a copy of Moxa Tech WinCE 5.0 driver package and extract it to your computer. Double click the Install package to copy the **Mxser** folder to %WINCEROOT%\PLATFORM\ automatically, and import the supported Moxa Tech products into the **Folder**.

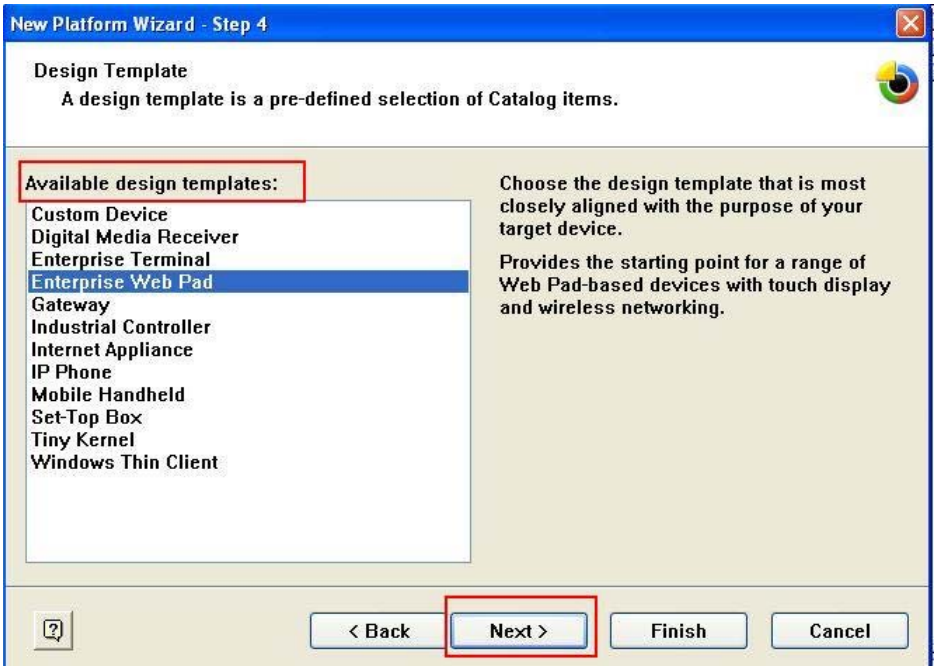
1. Start WinCE Platform Builder, select **File**, and open **New Platform**.

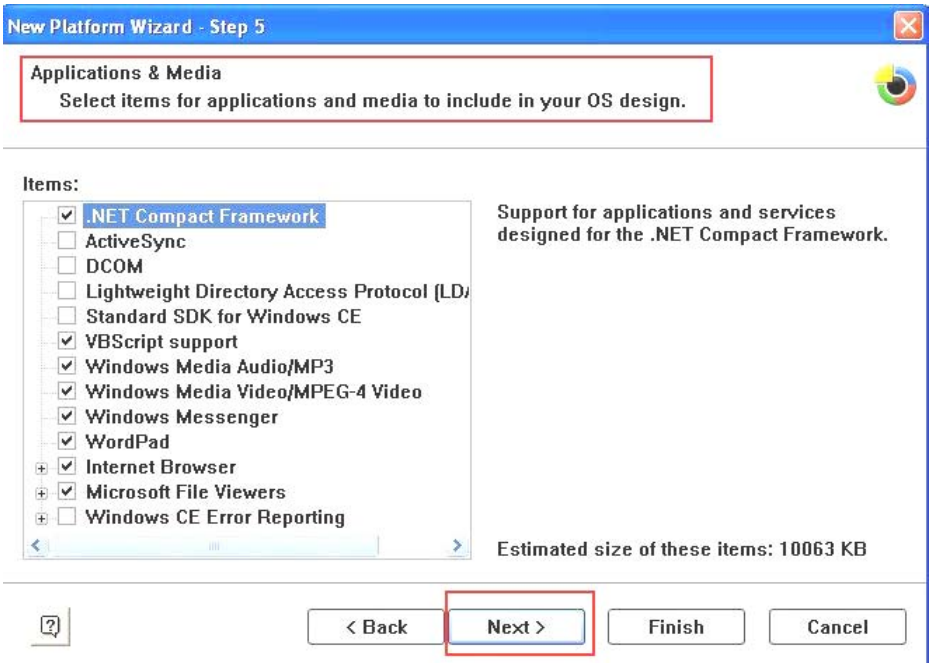


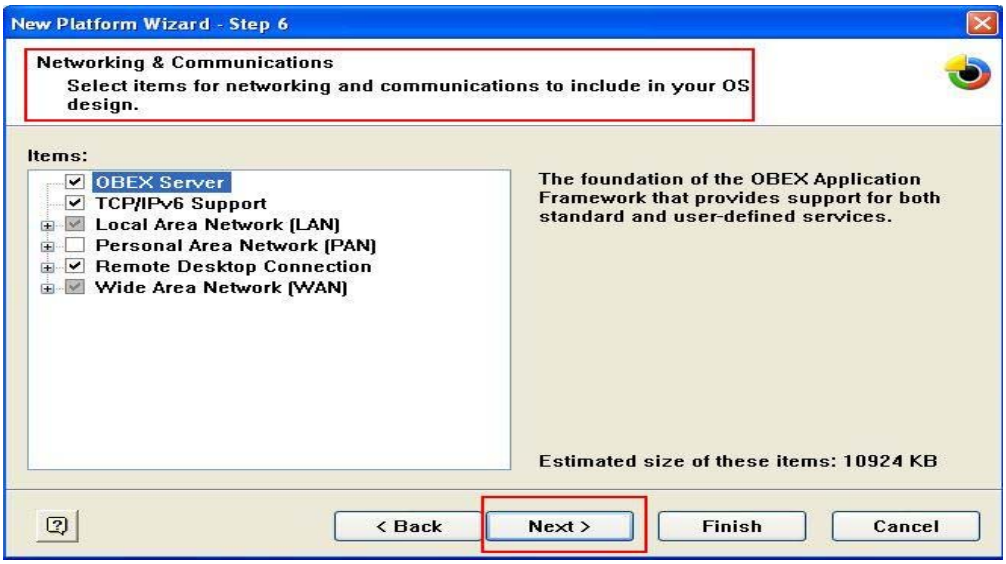
2. Enter a Name for Workspace and press **Next**.

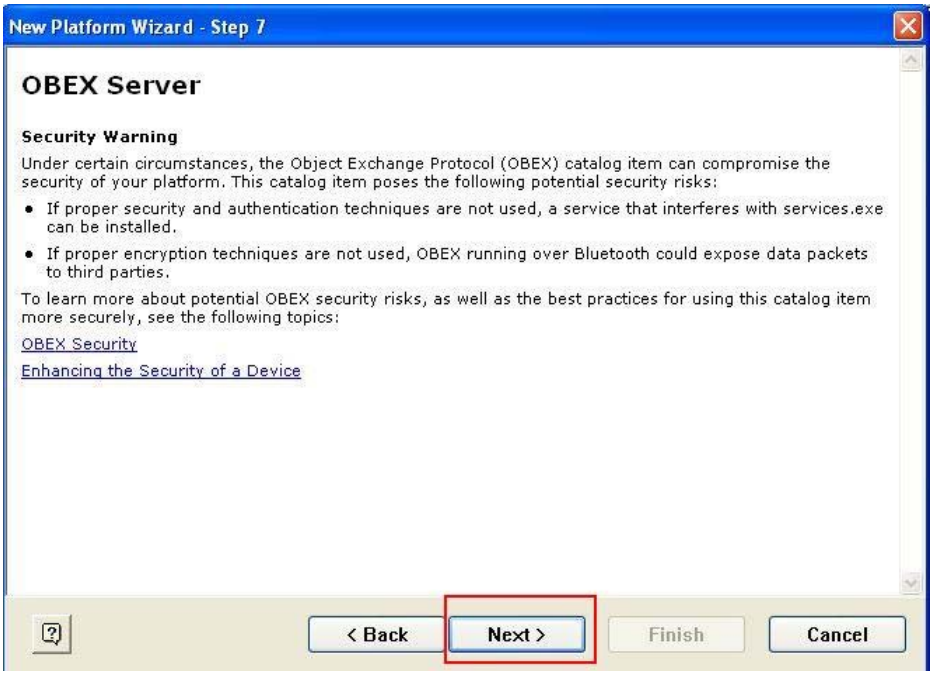


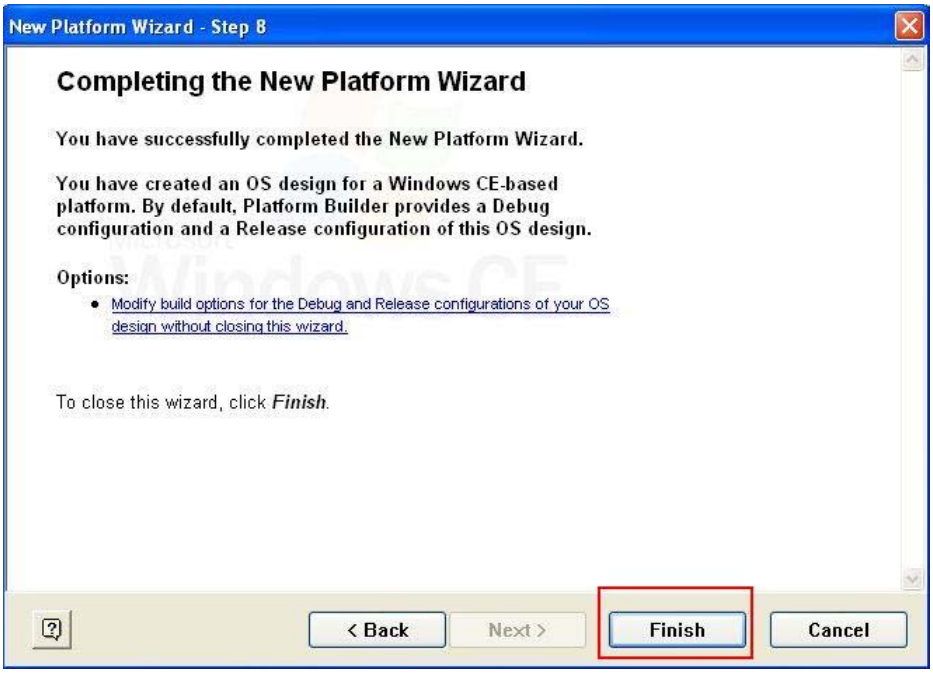
3. When you see **Board Support Packages, Design Template, Applications & Media**, **Networking & Communications**, **OBEX Server**, select what you need to build your own environment. The **Completing the New Platform Wizard** window will open to indicate that it has finished creating a new platform. Click **Finish** to complete the setup.


New Platform Wizard - Step 4
Design Template
A design template is a pre-defined selection of Catalog items.
Available design templates:
Custom Device
Digital Media Receiver
Enterprise Terminal
Enterprise Web Pad
Gateway
Industrial Controller
Internet Appliance
IP Phone
Mobile Handheld
Set-Top Box
Tiny Kernel
Windows Thin Client
Choose the design template that is most closely aligned with the purpose of your target device.
Provides the starting point for a range of Web Pad-based devices with touch display and wireless networking.
< Back
Next >
Finish
Cancel


New Platform Wizard - Step 5
Applications & Media
Select items for applications and media to include in your OS design.
Items:
.NET Compact Framework
ActiveSync
DCOM
Lightweight Directory Access Protocol (LD
Standard SDK for Windows CE
VBScript support
Windows Media Audio/MP3
Windows Media Video/MPEG-4 Video
Windows Messenger
WordPad
Internet Browser
Microsoft File Viewers
Windows CE Error Reporting
Support for applications and services designed for the .NET Compact Framework.
Estimated size of these items: 10063 KB
< Back
Next >
Finish
Cancel


New Platform Wizard - Step 6
Networking & Communications
Select items for networking and communications to include in your OS design.
Items:
OBEX Server
TCP/IPv6 Support
Local Area Network (LAN)
Personal Area Network (PAN)
Remote Desktop Connection
Wide Area Network (WAN)
The foundation of the OBEX Application Framework that provides support for both standard and user-defined services.
Estimated size of these items: 10924 KB
< Back
Next >
Finish
Cancel

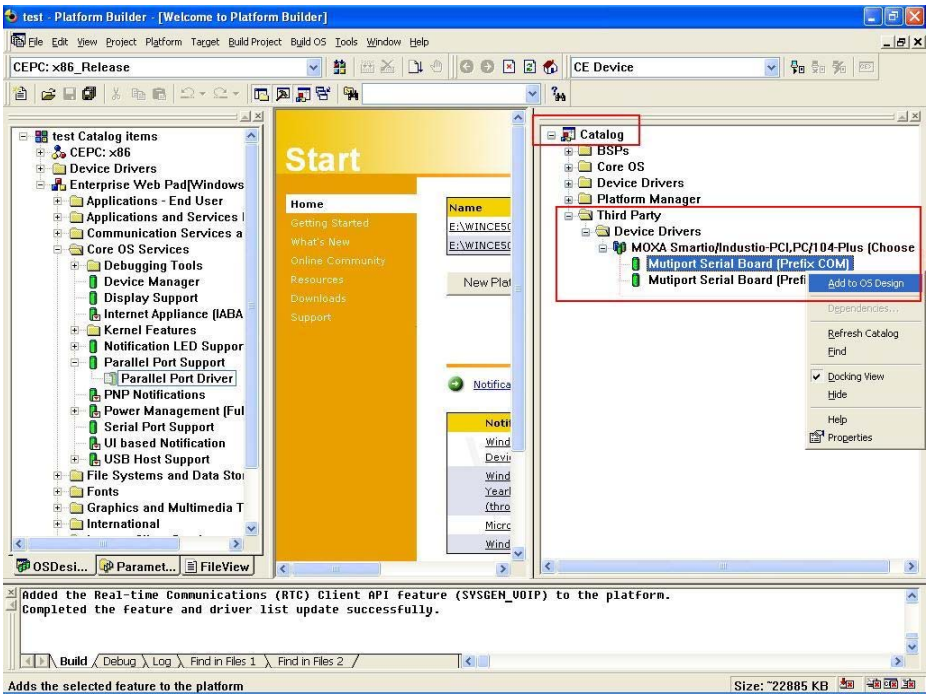

New Platform Wizard - Step 7
OBEX Server
Security Warning
Under certain circumstances, the Object Exchange Protocol (OBEX) catalog item can compromise the security of your platform. This catalog item poses the following potential security risks:
If proper security and authentication techniques are not used, a service that interferes with services.exe can be installed.
If proper encryption techniques are not used, OBEX running over Bluetooth could expose data packets to third parties.
To learn more about potential OBEX security risks, as well as the best practices for using this catalog item more securely, see the following topics:
OBEX Security
Enhancing the Security of a Device
< Back
Next >
Finish
Cancel


New Platform Wizard - Step 8
Completing the New Platform Wizard
You have successfully completed the New Platform Wizard.
You have created an OS design for a Windows CE-based platform. By default, Platform Builder provides a Debug configuration and a Release configuration of this OS design.
Options:
Modify build options for the Debug and Release configurations of your OS design without closing this wizard.
To close this wizard, click Finish.
< Back
Next >
Finish
Cancel

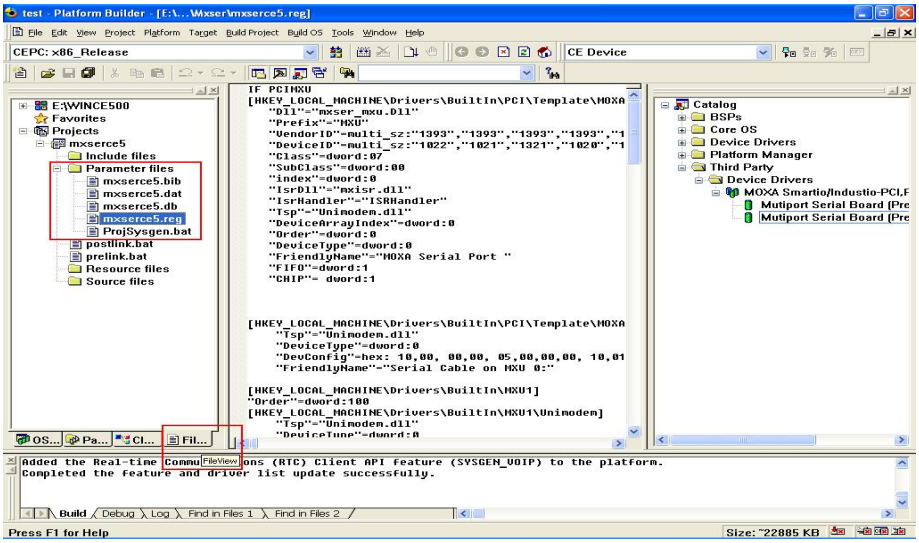
Open Manage Catalog Items (**File → Manage Catalog Items**). In the **Catalog (View → Catalog)**, browse to **\Third Party\Device Drivers\ MOXA Smartio/Industio-PCI, PC/104-Plus**. Right-click on the driver **Prefix COM** or **Prefix MXU** you would like to include and choose Add to **OS Design**.

Note: You can only select either **Prefix COM** or **Prefix MXU,** but not both.

Prefix COM supports up to 10 ports, from COM0 to COM9. Prefix MXU supports more than 10 ports, so it is better for you to select Prefix MXU if you are not sure how many ports the device has. Otherwise, you will only be allowed to use one multiport serial board on the target host.



After adding Moxa Tech drivers into your **OS Design**, a new project is automatically added to your workspace. The project name is **mxserce5**. The project can be accessed from File View **(View → File View)**. The **mxserce5** project contains a number of files used to configure the drivers included in your **OS Design**.



Note: If you would like to use "Terminal Emulator" tool, please modify mxserce5.reg and keyboard like below (This is only just for "one" "COM" port). You have to notice number of ports, COM, MXU and enter the correct information.

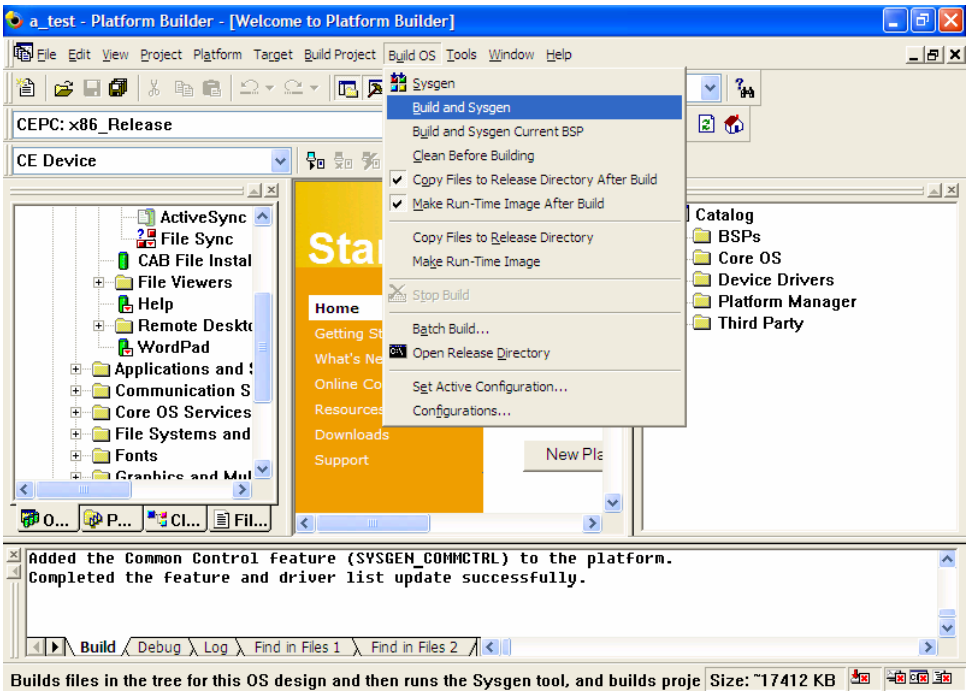
[HKEY_LOCAL_MACHINE\ExtModems\HayesCompat1]

"Port"="COM2:"

"DeviceType"=dword:1

"FriendlyName"="Hayes Compatible on COM2:"

Finally, open **Build OS**, select **Build and Sysgen**, and be sure to click **Copy Files to Release Directory After Build** and **Make Run-Time Image After Build**.



Finally, copy your image file to the target Host.

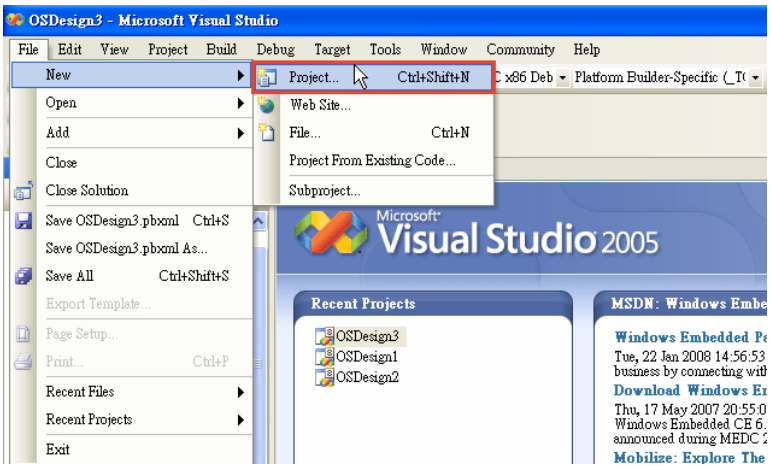
Note: If you have created a Windows CE Platform Builder in the development environment, you can skip steps 2, 3, and 4.

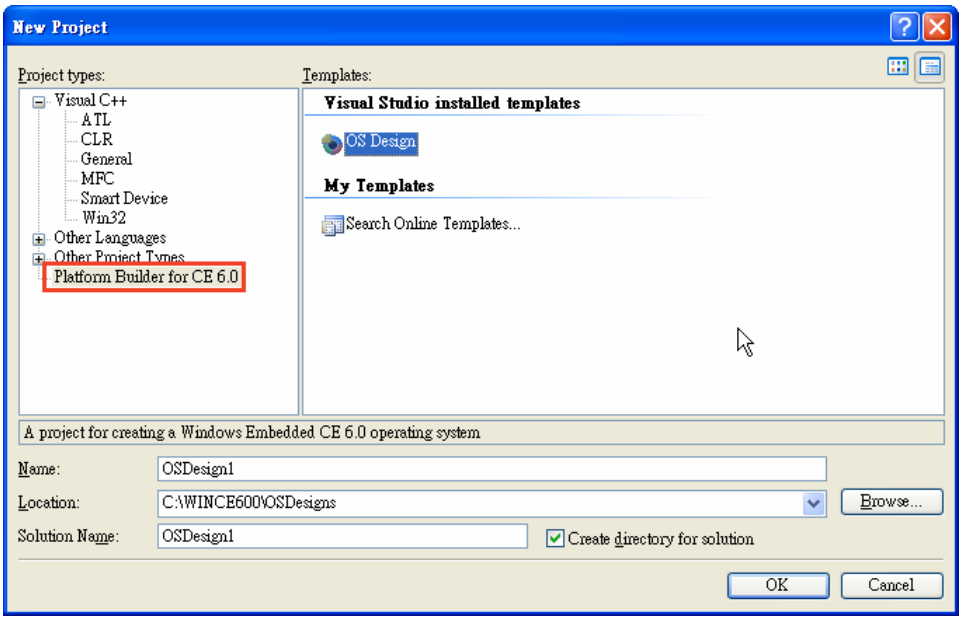
Windows CE 6.0 Installation

The following procedure explains how to install the CP-102U multiport serial board driver under WinCE 6.0.

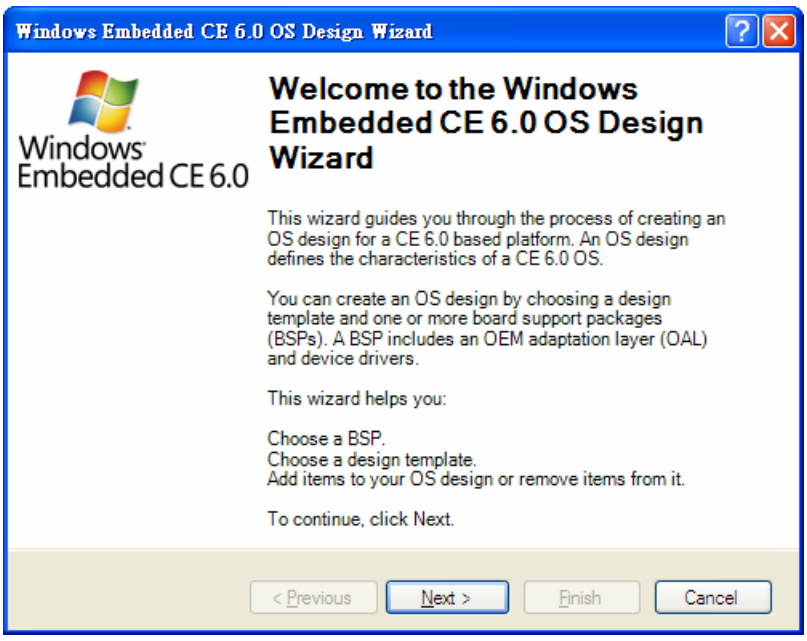
1. Obtain a copy of Moxa's WinCE 6.0 driver and extract it to your computer. Double click the install package to automatically install **Mxser**.

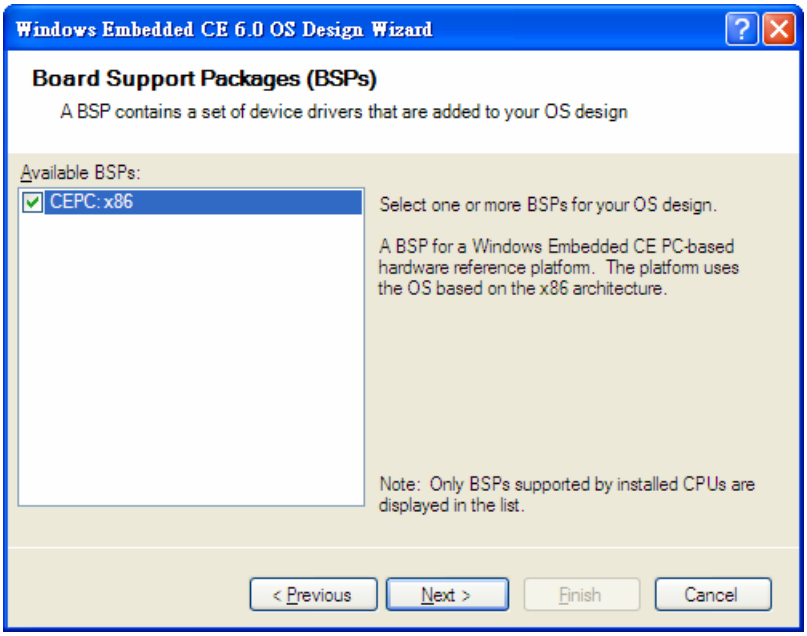
2. Create a new project in Visual Studio 2005.
   In Visual Studio 2005, click **File → New → Project** and select "**Platform Builder for CE 6.0**." Choose "**OS Design**" template and then click **OK**.



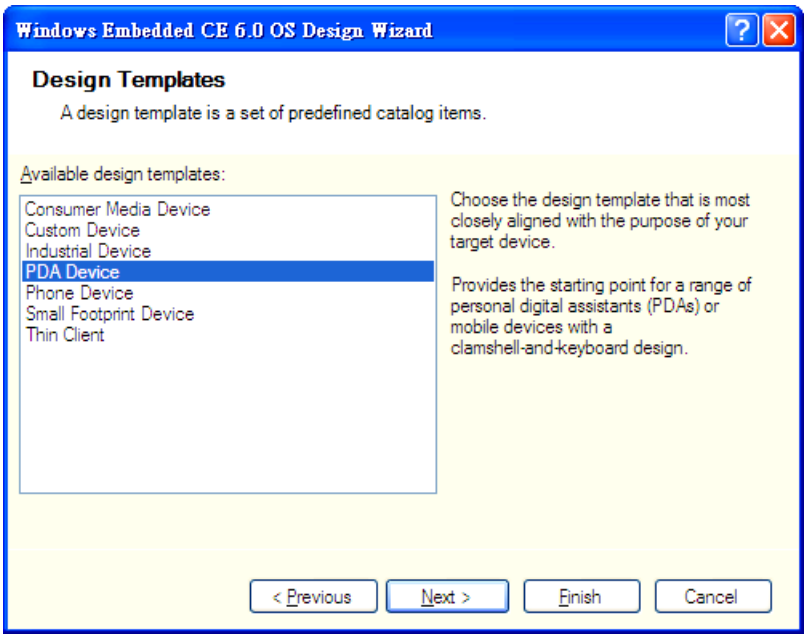


3. The CE 6.0 OS Design Wizard will start. Click "**Next**" to get the **Board Support Packages** page and select CEPC: **x86**. Click "Next" to continue.

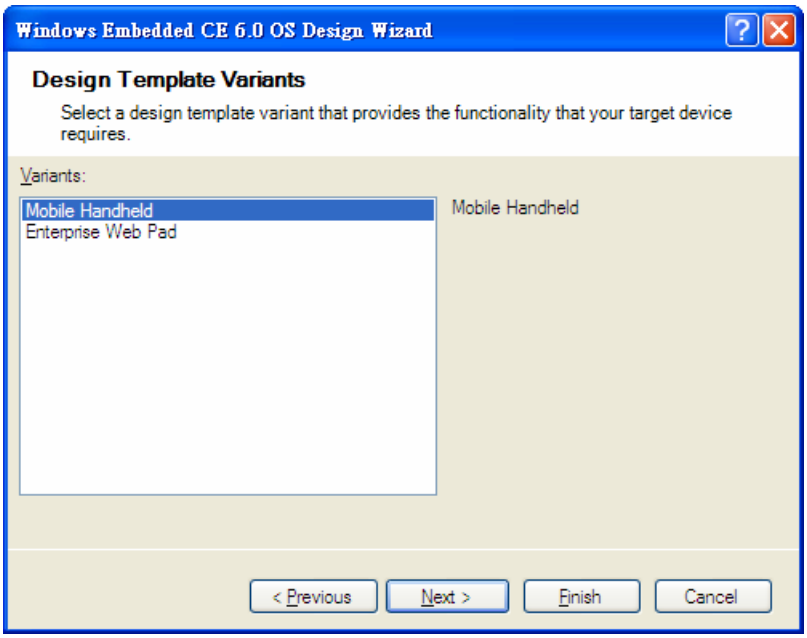

Windows Embedded CE 6.0 OS Design Wizard
Windows Embedded CE 6.0
Welcome to the Windows Embedded CE 6.0 OS Design Wizard
This wizard guides you through the process of creating an OS design for a CE 6.0 based platform. An OS design defines the characteristics of a CE 6.0 OS.
You can create an OS design by choosing a design template and one or more board support packages (BSPs). A BSP includes an OEM adaptation layer (OAL) and device drivers.
This wizard helps you:
Choose a BSP.
Choose a design template.
Add items to your OS design or remove items from it.
To continue, click Next.
< Previous
Next >
Finish
Cancel


Windows Embedded CE 6.0 OS Design Wizard
Board Support Packages (BSPs)
A BSP contains a set of device drivers that are added to your OS design
Available BSPs:
CEPC: x86
Select one or more BSPs for your OS design.
A BSP for a Windows Embedded CE PC-based hardware reference platform. The platform uses the OS based on the x86 architecture.
Note: Only BSPs supported by installed CPUs are displayed in the list.
< Previous
Next >
Finish
Cancel

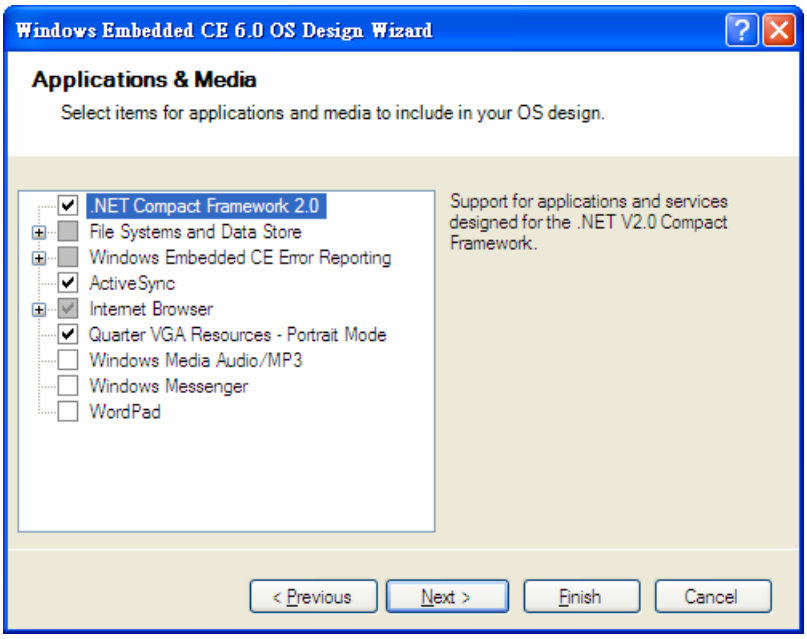
4. On the **Design Templates** page select your environment, PDA Device for example. Click "**Next**" to continue.


Windows Embedded CE 6.0 OS Design Wizard
Design Templates
A design template is a set of predefined catalog items.
Available design templates:
Consumer Media Device
Custom Device
Industrial Device
PDA Device
Phone Device
Small Footprint Device
Thin Client
Choose the design template that is most closely aligned with the purpose of your target device.
Provides the starting point for a range of personal digital assistants (PDAs) or mobile devices with a clamshell-and-keyboard design.
< Previous
Next >
Finish
Cancel

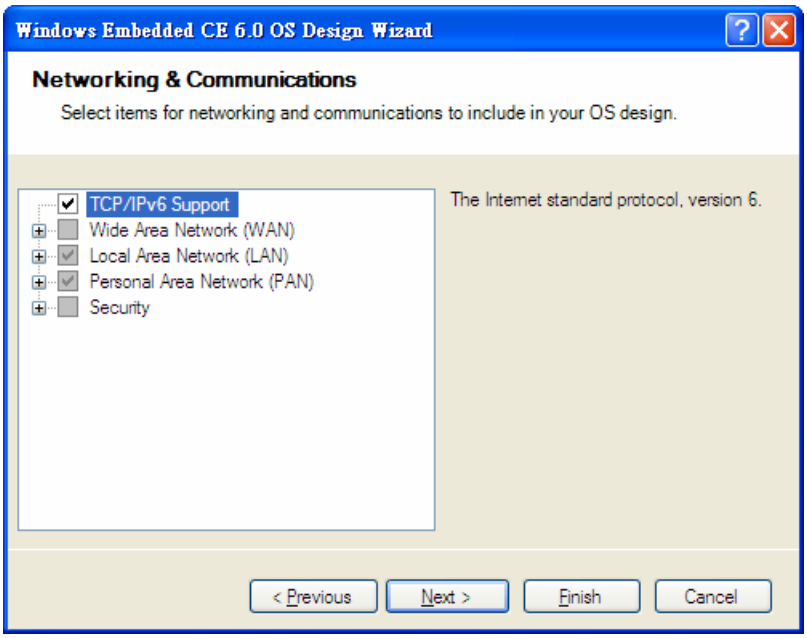
5. On the Design Template Variants page select your environment, Mobile Handheld for example. Click "**Next**" to continue.



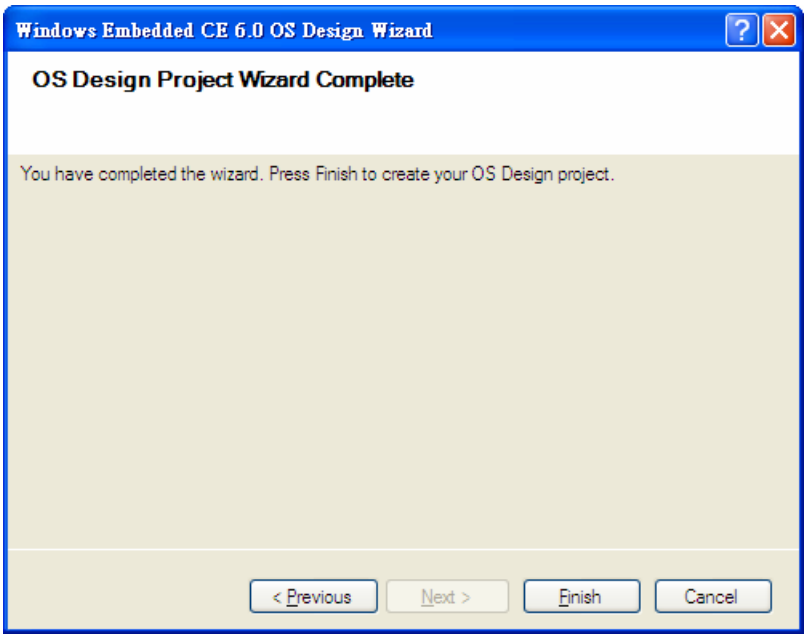
6. On the **Application & Media** page select your environment, .NET Compact Framework 2.0, ActiveSync, and Quarter VGA Resources-Portrait Mode for example. Click "**Next**" to continue.


Windows Embedded CE 6.0 OS Design Wizard
Applications & Media
Select items for applications and media to include in your OS design.
.NET Compact Framework 2.0
File Systems and Data Store
Windows Embedded CE Error Reporting
ActiveSync
Internet Browser
Quarter VGA Resources - Portrait Mode
Windows Media Audio/MP3
Windows Messenger
WordPad
Support for applications and services designed for the .NET V2.0 Compact Framework.
< Previous
Next >
Finish
Cancel

7. On the Networking & Communication page select your environment, TCP/IPv6 Support for example. Click "**Next**" to continue.

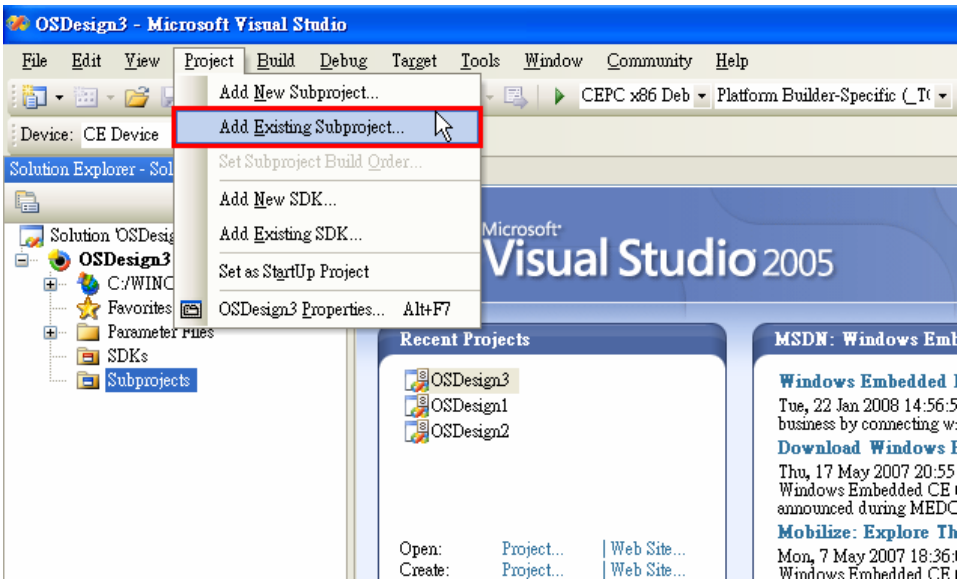

Windows Embedded CE 6.0 OS Design Wizard
Networking & Communications
Select items for networking and communications to include in your OS design.
TCP/IPv6 Support
Wide Area Network (WAN)
Local Area Network (LAN)
Personal Area Network (PAN)
Security
The Internet standard protocol, version 6.
< Previous
Next >
Finish
Cancel

8. When the **OS Design Project Wizard Complete** screen appears, click "**Finish**." The catalog notification will pop up. Click "**Acknowledge"** to finish the project.

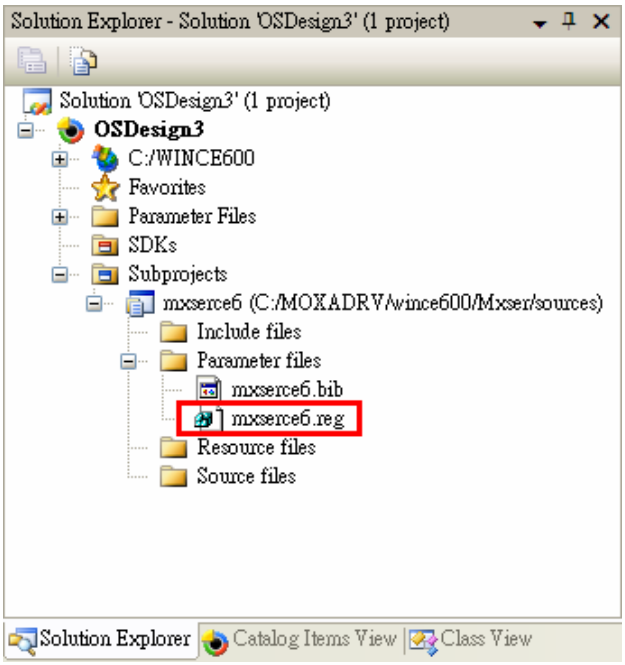

Windows Embedded CE 6.0 OS Design Wizard
OS Design Project Wizard Complete
You have completed the wizard. Press Finish to create your OS Design project.
< Previous
Next >
Finish
Cancel

Catalog Item Notification
OBEX Server
Security Warning
Security Warning
Under certain circumstances, the Object Exchange Protocol (OBEX) catalog item can compromise the security of your platform. This catalog item poses the following potential security risks:
If proper security and authentication techniques are not used, a service that interferes with services.exe can be installed.
If proper encryption techniques are not used, OBEX running over Bluetooth could expose data packets to third parties.
To learn more about potential OBEX security risks, as well as the best practices for using this catalog item more securely, see the following topics:
OBEX Security
Enhancing the Security of a Device
Acknowledge
Cancel

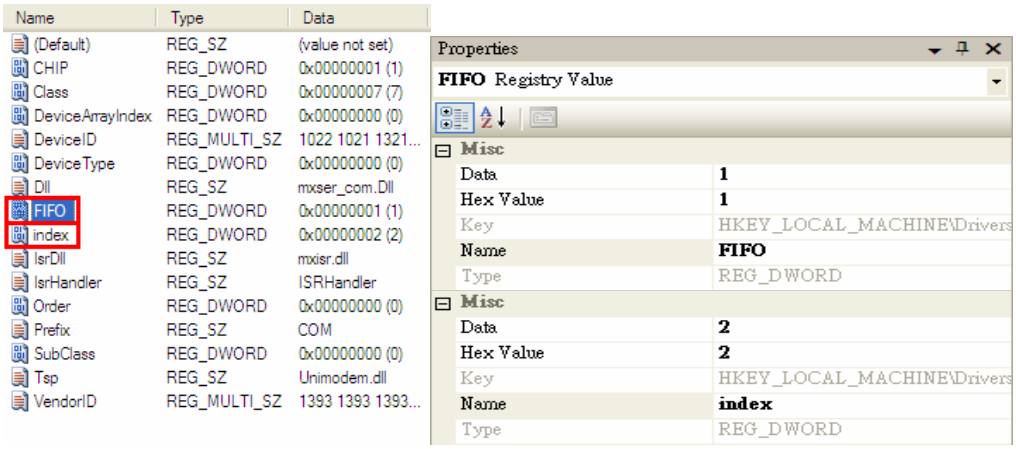
9. Open the project you created. Click **Project** on top of the screen, and select **Add Existing Subproject**. Specify the PCI MSB **Mxser** driver location with the subproject file "**mxserce6.pbpxml**."



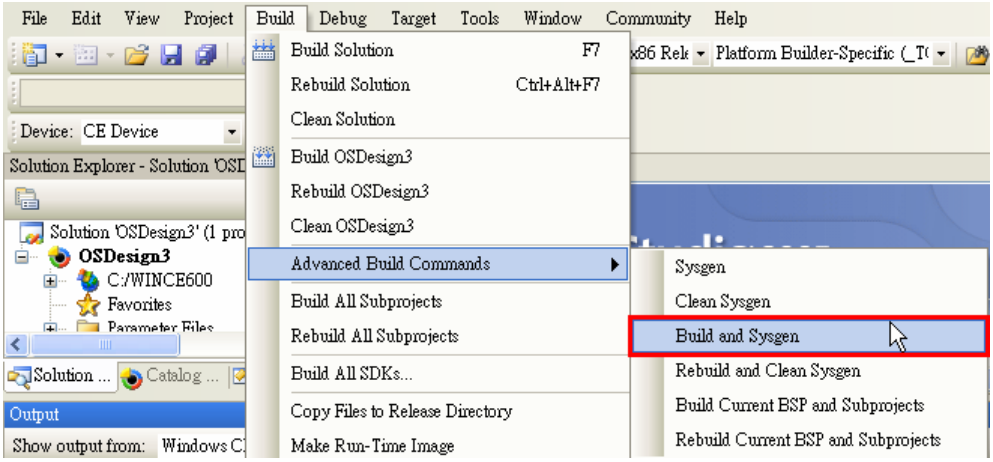
10. After the subproject is added, you may configure the "**mxserce6.reg**" registry file with the location [HKEY_LOCAL_MACHINE\Drivers\BuiltIn\PCI\Template\MOXAPCICOM].



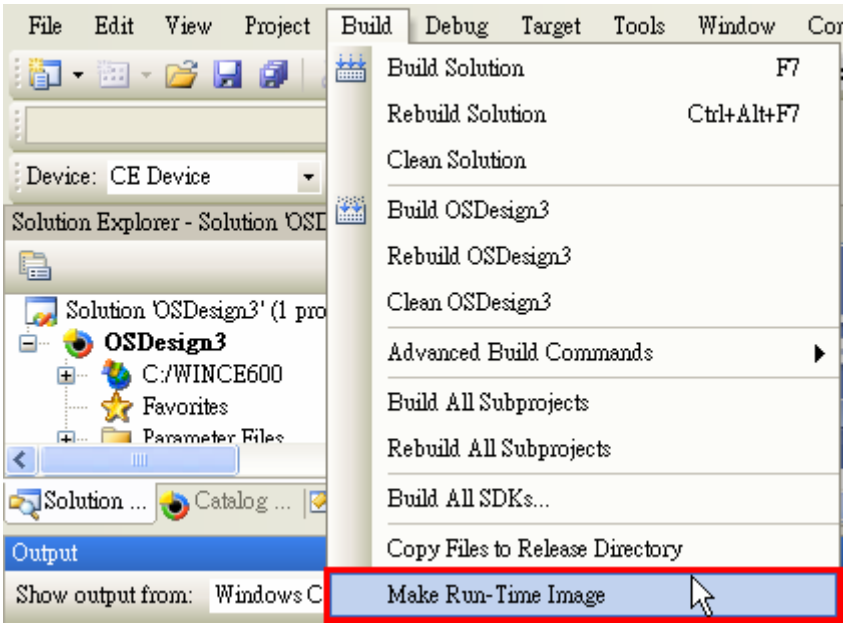
11. Configuring FIFO and index: Setting the FIFO registry value to **1** enables the FIFO function and **0** disables it. The index allows you to define the initial COM port number in WinCE, but before using this function; make sure that the COM port numbers do not conflict.



12. Open **Build** and select **Advanced Build Commands** and choose **Build Sysgen**. This operation will take you a few minutes.



13. After building sysgen, select **Build** and choose **Make Run-Time Image** to create the WinCE OS image. Finally, copy your image file to the target Host.



9
Driver Installation: Non Windows

The following topics are covered in this chapter:

- **Overview**
- **DOS**
  - Installing the Driver
  - Setting up the Driver
  - Loading the Driver
  - Unloading the Driver
- **Linux (32-bit/64-bit)**
- **SCO**

Overview

This chapter explains how to install, configure, update, and remove the board drivers for non Windows operating systems. Before installing the software, be sure to install the hardware first. For details on installing the hardware, please refer to Chapter 2.

You can download DOS, Linux, and SCO drivers from the Moxa website. For information on developing your own serial programming applications, please refer to the next chapter.

DOS

Moxa DOS API-232 is a software package that can help you develop or debug serial communications programs. This section will show you how to install the package, how to set up the driver, and how to load or unload the driver. The following models are supported:

2 Ports	4 Ports	8 Ports
CP-112UL/ CP-112UL-I	CP-114UL / CP-114UL-I	CP-118U / CP-118U-I
CP-132UL / CP-132UL-I	CP-134U / CP-134U-I	CP-138U / CP-138U-I
CP-102UL	CP-104UL	CP-168U
CP-102U	CP-104JU	
CP-102UF	POS-104UL	

Installing the Driver

1. Run the installation program, **DOSINST.EXE** under \Software\DOS on the Document & Software CD. Specify the target directory for the API-232 files (e.g., C:\MOXA). Press **F2** to start the installation.

After installation is complete, you will be prompted to set up the board and driver initial values. It is strongly recommended that you set up the board and driver at this time by pressing **Y**.

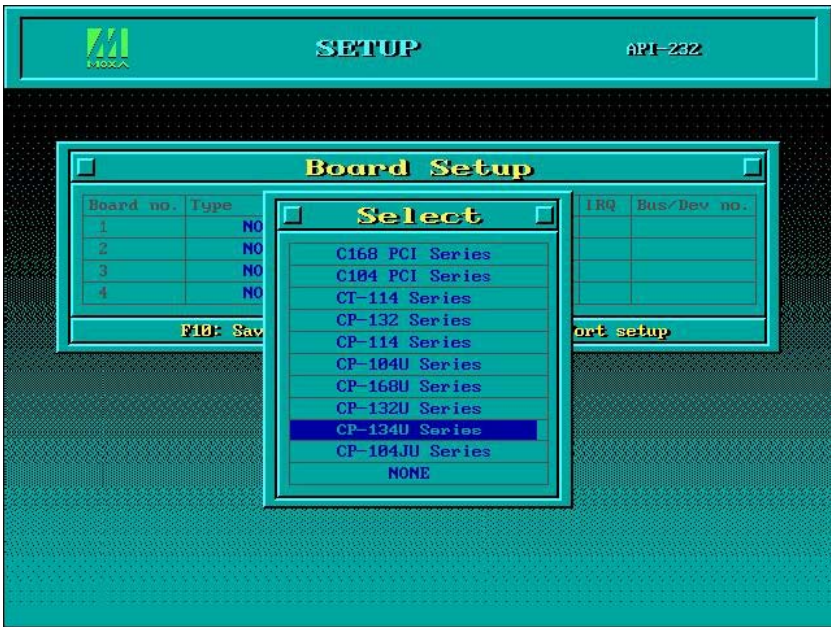
INSTALLATION
API-232
Installation complete, 57 files copied.
After leaving this program, you have to run
C:\MOXA\BIN\SETUP.EXE
program to setup board & driver initial values.
Do you want to run SETUP.EXE now ?(Y/N)

Setting up the Driver

The following instructions are not intended to illustrate every function of the setup program. For more detailed information, please refer to the help files by pressing **F1** in the setup program.

1. Run the setup program, **BIN\SETUP.EXE**.

   Select your board model (CP-134U in this example) and press **Enter**.



   Press **PgDn** to view and modify the setup options for the selected board.

SETUP
API-232
Board Setup
Board no. Type Port no. I/O Address IRQ Bus/Dev no.
1 CP-134U Series 1-4 DC00 7 0 / 11
2 NONE --
3 NONE --
4 NONE --
F10: Save & Exit Esc: Exit PgDn: Port setup

The settings for each port will be displayed. Verify the settings and make any necessary changes.

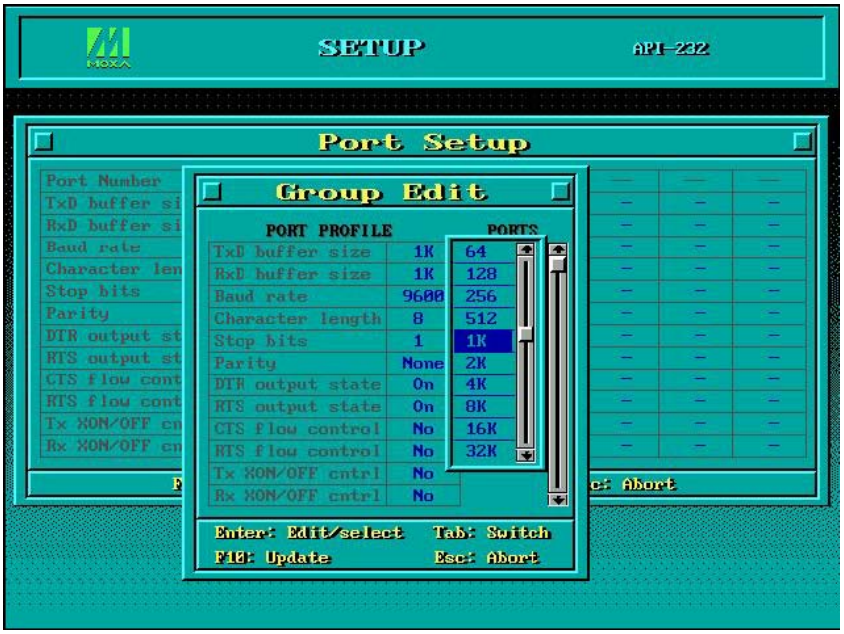
SETUP
API-232
Port Setup
Port Number 01 02 03 04 — — — —
TxD buffer size 1K 1K 1K 1K – – – –
RxD buffer size 1K 1K 1K 1K – – – –
Baud rate 9600 9600 9600 9600 – – – –
Character length 8 8 8 8 – – – –
Stop bits 1 1 1 1 – – – –
Parity None None None None – – – –
DTR output state On On On On – – – –
RTS output state On On On On – – – –
CTS flow control No No No No – – – –
RTS flow control No No No No – – – –
Tx XON/OFF cntrl No No No No – – – –
Rx XON/OFF cntrl No No No No – – – –
F1: Help F5: Group edit F10: Save Esc: Abort

Port number: This is the port ID of each port. Application software will refer to a port by its port number (ID). Port numbers must be unique; duplicate port numbers are not allowed. The port number can range from 0 to 255 as long as it does not overlap with another port. Generally, you should consider the convenience of programming when specifying the port number.

TxD buffer size: This is the transmission (output) buffer allocated in the system for each port.

RxD buffer size: This is the receiving (input) buffer allocated in the system for each port.

F5: Group Edit: This allows you to configure several ports simultaneously as a group.



Press **F10** to save the latest configuration and exit the setup program.

Loading the Driver

After setting up the driver, you must load the driver in order to gain access to the serial ports on the serial board. Run **BIN\DP-DRV.EXE** at the DOS prompt. The driver will detect your multiport serial board automatically. You should see messages indicating successful detection of your module, such as the following:

```
Smartio/Industio Family DOS driver Version 1.9
Setup driver .
CP-134U series (Bus= x ,Dev=y) : OK!
Device driver setup O.K.
```

At this point, you can execute applications that support API-232 functions, or start developing applications using the API-232 library.

Unloading the Driver

To unload or release the driver from memory, enter **DP-DRV /Q** at the DOS prompt.

Linux (32-bit/64-bit)

The Linux drivers support the following models:

CP-102U	CP-114UL	CP-132UL-I	CP-138U-I
CP-102UL	CP-118U	CP-134U	CP-168U
CP-104JU	CP-118U-I	CP-134U-I	POS-104UL
CP-104UL	CP-132UL	CP-138U	CP-102UF

To install and load the Linux drivers, enter the following commands from the Linux prompt:

```
# mkdir moxa
# cd moxa
# tar -xzvf driv_linux_smart_vx.x_build_yymmddhh.tgz

# cd mxser
# make clean; make install

# cd /moxa/mxser/driver
# ./msmknod

# modprobe mxser
```

If the driver has loaded successfully, you should see a message such as the following:

```
MOXA Smartio/Industio family driver version 1.11
Found MOXA CP-168U series board(BusNo=2,DevNo=13)
ttyM0 – ttyM7 max. baudrate = 921600 bps
```

You can verify that the driver has loaded by entering the following:

```
# lsmode |grep mxser
```

You should see a message such as the following:

```
mxser 59484 0
```

The installation will include **msdiag**, a diagnostic utility, **msterm**, a terminal emulation program, and **msmon**, a monitoring utility. For additional information, please refer to **readme.txt** in the **/home/moxa/mxser** directory.

SCO

- **SCO OpenServer 5**
- **SCO OpenServer 6**
- **SCO UnixWare 7**

Follow the steps given in this section to install the SCO OpenServer 5/6 & SCO UnixWare 7 driver. The installation procedures for SCO UnixWare 7 and SCO OpenServer 5/6 are similar.

1. Copy the driver file **.tar** to your host.
2. #tar xvf <driver tar file>
   #/tmp/moxa/mxinstall
3. The window shown below will open next. Press RETURN to continue.

```
============================================================

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Moxa Smartio/Industio Family Device Driver Installation (Ver. 1.11)

============================================================

For SCO UnixWare 7


Tar files, please wait.....O.K.

Press RETURN to continue
```

4. <Note: If your environment is SCO OpenServer 5/6, you can skip step 4 & 5>
   When you see the screen below, select "Esc" to exit and reboot your computer.

MOXA Smartio/Industio Family Installation Utility (Ver 1.11)

Smartio/Industio Family Basic Configuration				
Board No.	Board Type	I/O Address	Interrupt	Bus/Dev No.
1	None	----------	----------	----------
2	None	----------	----------	----------
3	None	----------	----------	----------
4	None	----------	----------	----------
PgDn: getty Setting Esc: Exit Enter: Confirm Input Value Tab: Change Item				

5. After rebooting computer, key in "moxaadm", you will see MAIN MENU, select **Basic Configuration**.

MAIN MENU
Basic Configuration
Advanced Configuration
Interface Configuration
Port Monitoring
Terminal Emulation
Driver Removal
Exit

6. When you see the following screen, press Enter to select the MOXA Multiport Serial Board you installed by port and by model. For example, if you installed the CP-104UL, you should select 4 ports and then CP-104UL.

MOXA Smartio/Industio Family Installation Utility (Ver 1.11)

Smartio/Industio Family Basic Configuration				
Board No.	Board Type	I/O Address	Interrupt	Bus/Dev No.
1	None	----------	----------	----------
2	None	----------	----------	----------
3	None	----------	----------	----------
4	None	----------	----------	----------
PgDn: getty Setting Esc: Exit Enter: Confirm Input Value Tab: Change Item				

7. The board's basic information, such as I/O address, Bus No., and Device No., will be shown. The SCO system will assign the resources automatically to the Universal PCI board you selected.
8. Next, press "Esc" to exit and reboot your computer.
9. Note, whenever you change a MAIN MENU item, you have to reboot your computer.

10
Serial Programming Tools

The following topics are covered in this chapter:

- **Overview**
- **Serial Programming Library**
- **PComm Utilities**
  - Installation
  - PComm Diagnostic
  - PComm Monitor
  - PComm Terminal Emulator

Overview

Moxa provides Windows serial programming libraries and troubleshooting utilities that are easy to use and powerful. You can use these tools to reduce software development time.

The serial communication library is useful for developing applications for data communications, remote access, data acquisition, and industrial control. It provides a simpler solution compared to the more complex Windows Win32 COMM API.

PComm is a professional serial communication tool for Windows PCs. PComm includes the following features:

- Useful utilities for diagnostics, port monitoring, and terminal emulation
- Sample programs
- Comprehensive help files

Serial Programming Library

The serial programming library assists you in developing serial communications programs for any COM port that complies with the Microsoft Win32 API. It facilitates the implementation of multi-process and multi-thread serial communication programs and can remarkably reduce development time.

The library provides a complete set of functions as well as various sample programs for Visual C++, Visual Basic, and Delphi. To view detailed descriptions of the available functions and sample programs, go to **Start → Program → PComm Lite** and select **PComm Lib Help**, **PComm Porting Notes**, or **PComm Programming Guide**. You may also refer to the sample programs in the PComm directory.

PComm Utilities

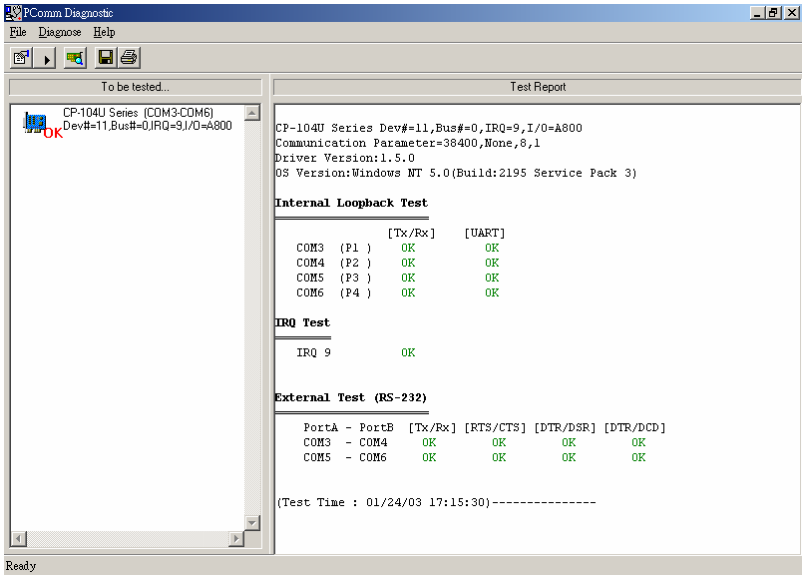
This section provides brief descriptions of the PComm utilities. For more information about these utilities, please refer to the Windows help files or to the API-232.txt file for DOS.

Installation

To install PComm, run **Setup.exe** from the Document and Software CD. Please note that the PComm diagnostic and monitor utilities are for Moxa boards only. These two utilities will not work with other serial boards.

PComm Diagnostic

PComm Diagnostic is designed for Moxa boards only. It provides internal and external testing of IRQ, TxD/RxD, UART, CTS/RTS, DTR/DSR, DTR/DCD, and other items. You can use PComm Diagnostic to check the operation of both software and hardware.

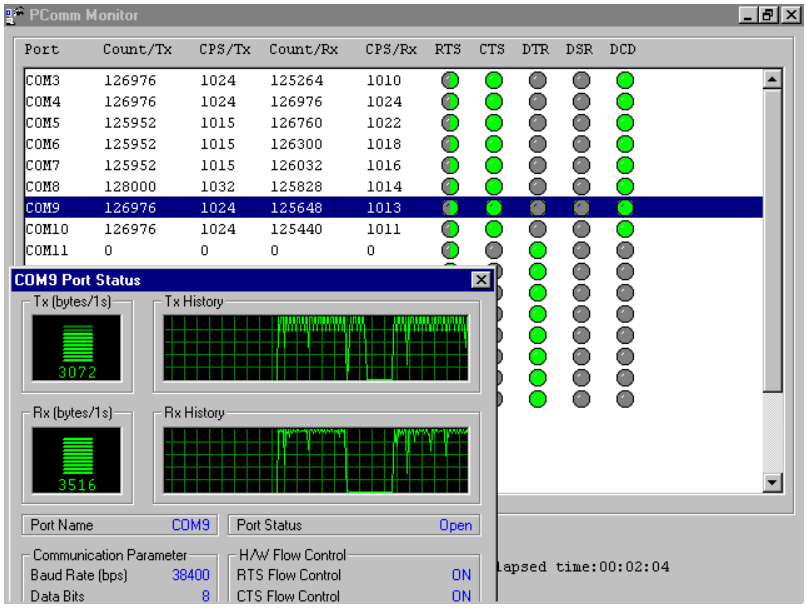


To run the Diagnostic program, go to **Start → Program → PComm Lite → Diagnostic**.

PComm Monitor

PComm Monitor is designed for Moxa boards in Windows NT only. It allows you to monitor data transmission of selected Moxa COM ports. It monitors data transmission, throughput, and line status at regular intervals. Click on a specific port to view that port's communication parameters and status.

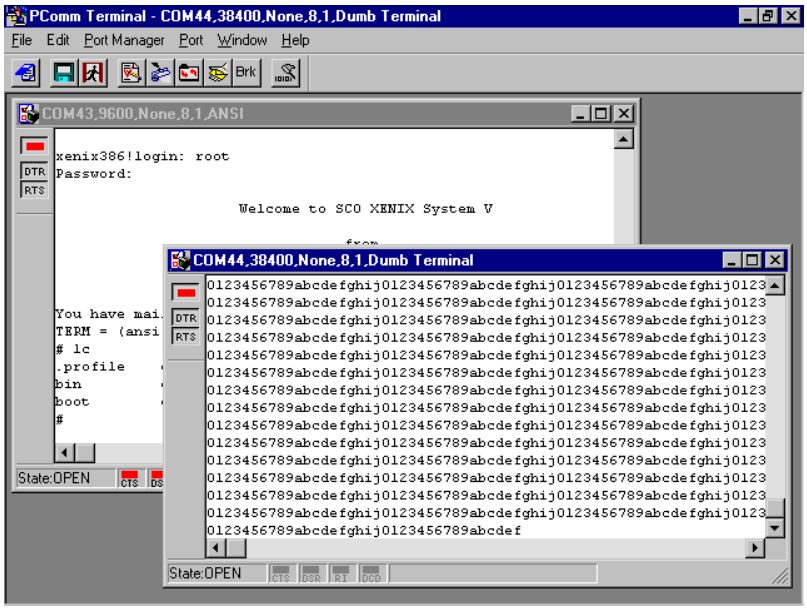
To run PComm Monitor, go to **Start → Program → PComm Lite → Monitor**.



PComm Terminal Emulator

PComm Terminal Emulator can be used to connect to a serial port to verify that data transmission is functioning correctly. It supports multiple windows and both VT100 and ANSI terminal types. You can interactively transfer data, periodically send patterns, and transfer files using ASCII, XMODEM, YMODEM, ZMODEM, and KERMIT protocols.

To run PComm Terminal Emulator, go to **Start → Program → PComm Lite → Terminal Emulator**.



11
Pin Assignments

The following topics are covered in this chapter:

- **Overview**
- **CP-102U**
- **CP-102UL**
- **CP-104JU**
- **CP-104UL**
- **CP-114UL**
- **CP-118U**
- **CP-118U-I**
- **CP-132UL, CP-132UL-I**
- **CP-134U, CP-134U-I**
- **CP-138U**
- **CP-138U-I**
- **CP-168U**
- **POS-104UL**
- **CP-102UF**
- **Serial Connectors**

Overview

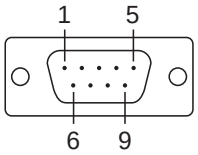
This chapter provides the pin assignments for each Moxa UPCI multiport serial board, as well as the pin assignments for the optional accessories. Except for the CP-102U and CP-102UF, which have two built-in DB9 (male) serial connectors and an ST type fiber connector, respectively, Moxa's UPCI boards do not have built-in serial port connectors. For all other models, you will need a cable or other accessory with standard serial connectors in order to connect serial devices to the board. The following chart shows the available cables and accessories for each model.

Model	Board Connector	Supported Accessories	Serial Connectors
CP-102U	2×DB9 (male)	---	---
CP-102UL CP-112UL CP-112UL-I CP-132UL CP-132UL-I	DB25 (female)	CBL-M25M9x2-50	2×DB9 (male)
CP-104UL CP-114UL CP-114UL-I CP-134U CP-134U-I	DB44 (female)	CBL-M44M9x4-50	4×DB9 (male)
		CBL-M44M25x4-50	4×DB25 (male)
CP-104JU	RJ45	CBL-RJ45M9-150	4×DB9 (male)
		CBL-RJ45M25-150	4×DB25 (male)
CP-118U CP-138U CP-168U	DB62 (female)	OPT8-M9 CBL-M62M9x8-100 (OPT8D)	8×DB9 (male)
		OPT8B CBL-M62M25x8-100 (OPT8C)	8×DB25 (male)
		OPT8A, OPT8S, OPT8F, OPT8Z, OPT8K, OPT8I	8×DB25 (female)
		OPT8-RJ45*	8×RJ45
CP-118U-I CP-138U-I	DB78 (female)	CBL-M78M9x8-100	8×DB9 (male)
		CBL-M78M25x8-100	8×DB25 (male)
POS-104UL	DB44 (female)	CBL-M44M9x4-50(POS)	4×DB9 (male)
CP-102UF	STx2	---	---

* The OPT8-RJ45 is designed for RS-232 only. It should only be used with the CP-118U in RS-232 mode or with the CP-168U.

The serial connectors on each accessory use standard serial port pin assignments. Please refer to the Serial Connectors section for details.

CP-102U



This board supports RS-232 only.

Model	Board Connector	Supported Accessories	Serial Connectors
CP-102U	2×DB9 (male)	---	---

DB9 (Male): RS-232

Pin	Signal
1	DCD
2	RxD
3	TxD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS

CP-102UL

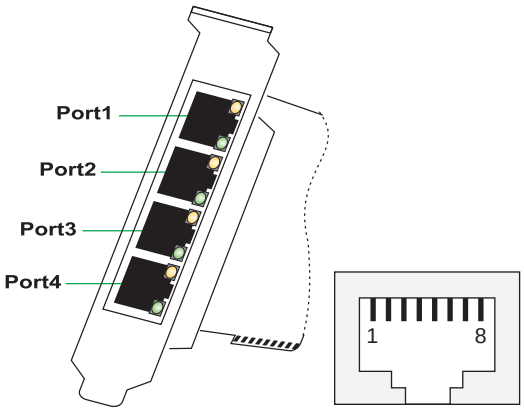
This board supports RS-232 only.

Model	Board Connector	Supported Accessories	Serial Connectors
CP-102UL	DB25 (female)	CBL-M25M9x2-50	2×DB9 (male)

DB25 (Female): RS-232

Pin	Signal	Pin	Signal
1	---	14	---
2	DCD1	15	DTR1
3	GND	16	DSR1
4	CTS1	17	RTS1
5	RxD1	18	TxD1
6	---	19	---
7	---	20	---
8	---	21	DCD0
9	DTR0	22	GND
10	DSR0	23	CTS0
11	RTS0	24	RxD0
12	TxD0	25	---
13	---	---	---

CP-104JU



This board supports RS-232 only.

Model	Board Connector	Supported Accessories	Serial Connectors
CP-104JU	RJ45	CBL-RJ45M9-150	4×DB9 (male)
		CBL-RJ45M25-150	4×DB25 (male)

8-pin RJ45: RS-232

Pin	Signal
1	DSR
2	RTS
3	GND
4	TxD
5	RxD
6	DCD
7	CTS
8	DTR

CP-104UL

This board supports RS-232 only.

Model	Board Connector	Supported Accessories	Serial Connectors
CP-104UL	DB44 (female)	CBL-M44M9x4-50	4×DB9 (male)
		CBL-M44M25x4-50	4×DB25 (male)

DB44 (Female): RS-232

Pin	Signal	Pin	Signal	Pin	Signal
1	TxD3	16	CTS3	31	DCD3
2	RxD3	17	DTR3	32	---
3	RTS3	18	DSR3	33	GND
4	---	19	---	34	---
5	TxD2	20	CTS2	35	DCD2
6	RxD2	21	DTR2	36	---
7	RTS2	22	DSR2	37	GND
8	---	23	---	38	---
9	TxD1	24	CTS1	39	DCD1
10	RxD1	25	DTR1	40	---
11	RTS1	26	DSR1	41	GND
12	---	27	---	42	DCD0
13	TxD0	28	CTS0	43	---
14	RxD0	29	DTR0	44	GND
15	RTS0	30	DSR0		

CP-114UL

This board supports RS-232, RS-422, and RS-485 (both 2 and 4-wire).

Model	Board Connector	Supported Accessories	Serial Connectors
CP-114UL	DB44 (female)	CBL-M44M9x4-50	4×DB9 (male)
		CBL-M44M25x4-50	4×DB25 (male)

DB44 (Female): RS-232

Pin	Signal	Pin	Signal	Pin	Signal
1	TxD3	16	CTS3	31	DCD3
2	RxD3	17	DTR3	32	---
3	RTS3	18	DSR3	33	GND
4	---	19	---	34	---
5	TxD2	20	CTS2	35	DCD2
6	RxD2	21	DTR2	36	---
7	RTS2	22	DSR2	37	GND
8	---	23	---	38	---
9	TxD1	24	CTS1	39	DCD1
10	RxD1	25	DTR1	40	---
11	RTS1	26	DSR1	41	GND
12	---	27	---	42	DCD0
13	TxD0	28	CTS0	43	---
14	RxD0	29	DTR0	44	GND
15	RTS0	30	DSR0		

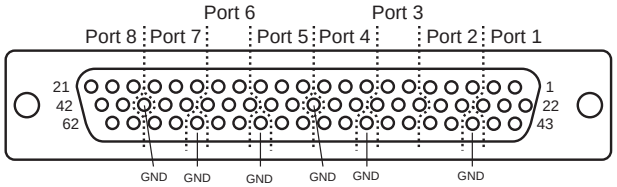
DB44 (Female): RS-422, RS-485 (4-wire)

Pin	Signal	Pin	Signal	Pin	Signal
1	RxD3+(B)	16	---	31	TxD3-(A)
2	TxD3+(B)	17	RxD3-(A)	32	---
3	---	18	---	33	GND
4	---	19	---	34	---
5	RxD2+(B)	20	---	35	TxD2-(A)
6	TxD2+(B)	21	RxD2-(A)	36	---
7	---	22	---	37	GND
8	---	23	---	38	---
9	RxD1+(B)	24	---	39	TxD1-(A)
10	TxD1+(B)	25	RxD1-(A)	40	---
11	---	26	---	41	GND
12	---	27	---	42	TxD0-(A)
13	RxD0+(B)	28	---	43	---
14	RxD0-(A)	29	RxD0-(A)	44	GND
15	---	30	---		

DB44 (Female): RS-485 (2-wire)

Pin	Signal	Pin	Signal	Pin	Signal
1	Data3+(B)	16	---	31	---
2	---	17	Data3-(A)	32	---
3	---	18	---	33	GND
4	---	19	---	34	---
5	Data2+(B)	20	---	35	---
6	---	21	Data2-(A)	36	---
7	---	22	---	37	GND
8	---	23	---	38	---
9	Data1+(B)	24	---	39	---
10	---	25	Data1-(A)	40	---
11	---	26	---	41	GND
12	---	27	---	42	---
13	Data0+(B)	28	---	43	---
14	---	29	Data0-(A)	44	GND
15	---	30	---		

CP-118U



This board supports RS-232, RS-422, and RS-485 (both 2 and 4-wire).

Model	Board Connector	Supported Accessories	Serial Connectors
CP-118U	DB62 (female)	OPT8-M9 CBL-M62M9x8-100 (OPT8D)	8×DB9 (male)
		OPT8B CBL-M62M25x8-100 (OPT8C)	8×DB25 (male)
		OPT8A, OPT8S	8×DB25 (female)
		OPT8-RJ45*	8×RJ45

* The OPT8-RJ45 is designed for RS-232 only. It should only be used with the CP-118U in RS-232 mode.

DB62 (Female): RS-232

Pin	Signal	Pin	Signal	Pin	Signal
1	TxD0	22	RxD0	43	CTS0
2	DTR0	23	DSR0	44	RTS0
3	RxD1	24	DCD0	45	GND
4	DSR1	25	TxD1	46	CTS1
5	DCD1	26	DTR1	47	RTS1
6	TxD2	27	RxD2	48	CTS2
7	DTR2	28	DSR2	49	RTS2
8	RxD3	29	DCD2	50	GND
9	DSR3	30	TxD3	51	CTS3
10	DCD3	31	DTR3	52	RTS3
11	RxD4	32	GND	53	CTS4
12	DSR4	33	TxD4	54	RTS4
13	DCD4	34	DTR4	55	GND
14	TxD5	35	RxD5	56	CTS5
15	DTR5	36	DSR5	57	RTS5
16	RxD6	37	DCD5	58	GND
17	DSR6	38	TxD6	59	CTS6
18	DCD6	39	DTR6	60	RTS6
19	RxD7	40	GND	61	CTS7
20	DSR7	41	TxD7	62	RTS7
21	DCD7	42	DTR7		

DB62 (Female): RS-422, RS-485 (4-wire)

Pin	Signal	Pin	Signal	Pin	Signal
1	RxD0+(B)	22	TxD0+(B)	43	---
2	RxD0-(A)	23	---	44	---
3	TxD1+(B)	24	TxD0-(A)	45	GND
4	---	25	RxD1+(B)	46	---
5	TxD1-(A)	26	RxD1-(A)	47	---
6	RxD2+(B)	27	TxD2+(B)	48	---
7	RxD2-(A)	28	---	49	---
8	TxD3+(B)	29	TxD2-(A)	50	GND
9	---	30	RxD3+(B)	51	---
10	TxD3-(A)	31	RxD3-(A)	52	---
11	TxD4+(B)	32	GND	53	---
12	---	33	RxD4+(B)	54	---
13	TxD4-(A)	34	RxD4-(A)	55	GND
14	RxD5+(B)	35	TxD5+(B)	56	---
15	RxD5-(A)	36	---	57	---
16	TxD6+(B)	37	TxD5-(A)	58	GND
17	---	38	RxD6+(B)	59	---
18	TxD6-(A)	39	RxD6-(A)	60	---
19	TxD7+(B)	40	GND	61	---
20	---	41	RxD7+(B)	62	---
21	TxD7-(A)	42	RxD7-(A)		

DB62 (Female): RS-485 (2-wire)

Pin	Signal	Pin	Signal	Pin	Signal
1	Data0+(B)	22	---	43	---
2	Data0-(A)	23	---	44	---
3	---	24	---	45	GND
4	---	25	Data1+(B)	46	---
5	---	26	Data1-(A)	47	---
6	Data2+(B)	27	---	48	---
7	Data2-(A)	28	---	49	---
8	---	29	---	50	GND
9	---	30	Data3+(B)	51	---
10	---	31	Data3-(A)	52	---
11	---	32	GND	53	---
12	---	33	Data4+(B)	54	---
13	---	34	Data4-(A)	55	GND
14	Data5+(B)	35	---	56	---
15	Data5-(A)	36	---	57	---
16	---	37	---	58	GND
17	---	38	Data6+(B)	59	---
18	---	39	Data6-(A)	60	---
19	---	40	GND	61	---
20	---	41	Data7+(B)	62	---
21	---	42	Data7-(A)		

CP-118U-I

This board supports RS-232, RS-422, and RS-485 (both 2 and 4-wire).

Model	Board Connector	Supported Accessories	Serial Connectors
CP-118U-I	DB78 (female)	CBL-M78M9x8-100	8×DB9 (male)
		CBL-M78M25x8-100	8×DB25 (male)

DB78 (Female): RS-232

Pin	Signal	Pin	Signal	Pin	Signal
1	GND7	27	DTR5	53	CTS2
2	TxD7	28	RTS4	54	DSR2
3	---	29	DTR4	55	CTS1
4	GND6	30	---	56	DSR1
5	TxD6	31	RTS3	57	---
6	GND5	32	DTR3	58	CTS0
7	TxD5	33	RTS2	59	DSR0
8	---	34	DTR2	60	DCD7
9	GND4	35	---	61	RxD7
10	TxD4	36	RTS1	62	DCD6
11	GND3	37	DTR1	63	RxD6
12	TxD3	38	RTS0	64	---
13	---	39	DTR0	65	DCD5
14	GND2	40	CTS7	66	RxD5
15	TxD2	41	DSR7	67	DCD4
16	GND1	42	---	68	RxD4
17	TxD1	43	CTS6	69	---
18	---	44	DSR6	70	DCD3
19	GND0	45	CTS5	71	RxD3
20	TxD0	46	DSR5	72	DCD2
21	RTS7	47	---	73	RxD2
22	DTR7	48	CTS4	74	---
23	RTS6	49	DSR4	75	DCD1
24	DTR6	50	CTS3	76	RxD1
25	---	51	DSR3	77	DCD0
26	RTS5	52	---	78	RxD0

DB78 (Female): RS-422, RS-485 (4-wire)

Pin	Signal	Pin	Signal	Pin	Signal
1	GND7	27	RxD5-(A)	53	---
2	RxD7+(B)	28	---	54	---
3	---	29	RxD4-(A)	55	---
4	GND6	30	---	56	---
5	RxD6+(B)	31	---	57	---
6	GND5	32	RxD3-(A)	58	---
7	RxD5+(B)	33	---	59	---
8	---	34	RxD2-(A)	60	TxD7-(A)
9	GND4	35	---	61	TxD7+(B)
10	RxD4+(B)	36	---	62	TxD6-(A)
11	GND3	37	RxD1-(A)	63	TxD6+(B)
12	RxD3+(B)	38	---	64	---
13	---	39	RxD0-(A)	65	TxD5-(A)

Pin	Signal	Pin	Signal	Pin	Signal
14	GND2	40	---	66	TxD5+(B)
15	RxD2+(B)	41	---	67	TxD4-(A)
16	GND1	42	---	68	TxD4+(B)
17	RxD1+(B)	43	---	69	---
18	---	44	---	70	TxD3-(A)
19	GND0	45	---	71	TxD3+(B)
20	RxD0+(B)	46	---	72	TxD2-(A)
21	---	47	---	73	TxD2+(B)
22	RxD7-(A)	48	---	74	---
23	---	49	---	75	TxD1-(A)
24	RxD6-(A)	50	---	76	TxD1+(B)
25	---	51	---	77	TxD0-(A)
26	---	52	---	78	TxD0+(B)

DB78 (Female): RS-485 (2-wire)

Pin	Signal	Pin	Signal	Pin	Signal
1	GND7	15	Data2+(B)	29	Data4-(A)
2	Data7+(B)	16	GND1	30	---
3	---	17	Data1+(B)	31	---
4	GND6	18	---	32	Data3-(A)
5	Data6+(B)	19	GND0	33	---
6	GND5	20	Data0+(B)	34	Data2-(A)
7	Data5+(B)	21	---	35	---
8	---	22	Data7-(A)	36	---
9	GND4	23	---	37	Data1-(A)
10	Data4+(B)	24	Data6-(A)	38	---
11	GND3	25	---	39	Data0-(A)
12	Data3+(B)	26	---	40	---
13	---	27	Data5-(A)	41	---
14	GND2	28	---	42	---

CP-132UL, CP-132UL-I

These boards support RS-422 and RS-485 (both 2 and 4-wire).

Model	Board Connector	Supported Accessories	Serial Connectors
CP-132UL CP-132UL-I	DB25 (female)	CBL-M25M9x2-50	2×DB9 (male)

DB25 (Female): RS-422

Pin	Signal	Pin	Signal
1	---	14	CTS1-(A)
2	TxD1-(A)	15	RxD1-(A)
3	GND1	16	RTS1-(A)
4	CTS1+(B)	17	RTS1+(B)
5	TxD1+(B)	18	RxD1+(B)
6	---	19	---
7	---	20	---
8	CTS0-(A)	21	TxD0-(A)
9	RxD0-(A)	22	GND0
10	RTS0-(A)	23	CTS0+(B)
11	RTS0+(B)	24	TxD0+(B)
12	RxD0+(B)	25	---
13	---		

DB25 (Female): RS-485 (4-wire)

Pin	Signal	Pin	Signal
1	---	14	---
2	TxD1-(A)	15	RxD1-(A)
3	GND1	16	---
4	---	17	---
5	TxD1+(B)	18	RxD1+(B)
6	---	19	---
7	---	20	---
8	---	21	TxD0-(A)
9	RxD0-(A)	22	GND0
10	---	23	---
11	---	24	TxD0+(B)
12	RxD0+(B)	25	---
13	---		

DB25 (Female): RS-485 (2-wire)

Pin	Signal	Pin	Signal
1	---	14	---
2	---	15	Data1-(A)
3	GND1	16	---
4	---	17	---
5	---	18	Data1+(B)
6	---	19	---
7	---	20	---
8	---	21	---
9	Data0-(A)	22	GND0
10	---	23	---
11	---	24	---
12	Data0+(B)	25	---
13	---		

CP-134U, CP-134U-I

These boards support RS-422 and RS-485 (both 2 and 4-wire). Ports 1 and 2 also support RS-232.

Model	Board Connector	Supported Accessories	Serial Connectors
CP-134U	DB44 (female)	CBL-M44M9x4-50	4×DB9 (male)
CP-134U-I		CBL-M44M25x4-50	4×DB25 (male)

DB44 (Female): RS-232 (Ports 1 and 2 only)

Pin	Signal	Pin	Signal	Pin	Signal
1	---	16	---	31	---
2	---	17	---	32	---
3	---	18	---	33	---
4	---	19	---	34	---
5	---	20	---	35	---
6	---	21	---	36	---
7	---	22	---	37	---
8	---	23	---	38	---
9	TXD1	24	CTS1	39	DCD1
10	RXD1	25	DTR1	40	RI1
11	RTS1	26	DSR1	41	GND
12	---	27	---	42	DCD0
13	TXD0	28	CTS0	43	RI0
14	RXD0	29	DTR0	44	GND
15	RTS0	30	DSR0		

DB44 (Female): RS-422

Pin	Signal	Pin	Signal	Pin	Signal
1	RXD3+(B)	16	CTS3+(B)	31	TXD3-(A)
2	TXD3+(B)	17	RXD3-(A)	32	CTS3-(A)
3	RTS3+(B)	18	RTS3-(A)	33	GND3
4	---	19	---	34	---
5	RXD2+(B)	20	CTS2+(B)	35	TXD2-(A)
6	TXD2+(B)	21	RXD2-(A)	36	CTS2-(A)
7	RTS2+(B)	22	RTS2-(A)	37	GND2
8	---	23	---	38	---
9	RXD1+(B)	24	CTS1+(B)	39	TXD1-(A)
10	TXD1+(B)	25	RXD1-(A)	40	CTS1-(A)
11	RTS1+(B)	26	RTS1-(A)	41	GND1
12	---	27	---	42	TXD0-(A)
13	RXD0+(B)	28	CTS0+(B)	43	CTS0-(A)
14	TXD0+(B)	29	RXD0-(A)	44	GND0
15	RTS0+(B)	30	RTS0-(A)		

DB44 (Female): RS-485 (4-wire)

Pin	Signal	Pin	Signal	Pin	Signal
1	RXD3+(B)	16	---	31	TXD3-(A)
2	TXD3+(B)	17	RXD3-(A)	32	---
3	---	18	---	33	GND3
4	---	19	---	34	---
5	RXD2+(B)	20	---	35	TXD2-(A)
6	TXD2+(B)	21	RXD2-(A)	36	---
7	---	22	---	37	GND2
8	---	23	---	38	---
9	RXD1+(B)	24	---	39	TXD1-(A)
10	TXD1+(B)	25	RXD1-(A)	40	---
11	---	26	---	41	GND1
12	---	27	---	42	TXD0-(A)
13	RXD0+(B)	28	---	43	---
14	TXD0+(B)	29	RXD0-(A)	44	GND0
15	---	30	---		

DB44 (Female): RS-485 (2-wire)

Pin	Signal	Pin	Signal	Pin	Signal
1	Data3+(B)	16	---	31	---
2	---	17	Data3-(A)	32	---
3	---	18	---	33	GND3
4	---	19	---	34	---

Pin	Signal	Pin	Signal	Pin	Signal
5	Data2+(B)	20	---	35	---
6	---	21	Data2-(A)	36	---
7	---	22	---	37	GND2
8	---	23	---	38	---
9	Data1+(B)	24	---	39	---
10	---	25	Data1-(A)	40	---
11	---	26	---	41	GND1
12	---	27	---	42	---
13	Data0+(B)	28	---	43	---
14	---	29	Data0-(A)	44	GND0
15	---	30	---		

CP-138U

This board supports RS-422 and RS-485 (both 2 and 4-wire).

Model	Board Connector	Supported Accessories	Serial Connectors
CP-138U	DB62 (female)	OPT8-M9 CBL-M62M9x8-100 (OPT8D)	8×DB9 (male)
		OPT8B CBL-M62M25x8-100 (OPT8C)	8×DB25 (male)
		OPT8A, OPT8S, OPT8F, OPT8Z, OPT8K, OPT8I	8×DB25 (female)

DB62 (Female): RS-422, RS-485 (4-wire)

Pin	Signal	Pin	Signal	Pin	Signal
1	RxD0+(B)	22	TxD0+(B)	43	---
2	RxD0-(A)	23	---	44	---
3	TxD1+(B)	24	TxD0-(A)	45	GND
4	---	25	RxD1+(B)	46	---
5	TxD1-(A)	26	RxD1-(A)	47	---
6	RxD2+(B)	27	TxD2+(B)	48	---
7	RxD2-(A)	28	---	49	---
8	TxD3+(B)	29	TxD2-(A)	50	GND
9	---	30	RxD3+(B)	51	---
10	TxD3-(A)	31	RxD3-(A)	52	---
11	TxD4+(B)	32	GND	53	---
12	---	33	RxD4+(B)	54	---
13	TxD4-(A)	34	RxD4-(A)	55	GND
14	RxD5+(B)	35	TxD5+(B)	56	---
15	RxD5-(A)	36	---	57	---
16	TxD6+(B)	37	TxD5-(A)	58	GND
17	---	38	RxD6+(B)	59	---

Pin	Signal	Pin	Signal	Pin	Signal
18	TxD6-(A)	39	RxD6-(A)	60	---
19	TxD7+(B)	40	GND	61	---
20	---	41	RxD7+(B)	62	---
21	TxD7-(A)	42	RxD7-(A)		

DB62 (Female): RS-485 (2-wire)

Pin	Signal	Pin	Signal	Pin	Signal
1	Data0+(B)	22	---	43	---
2	Data0-(A)	23	---	44	---
3	---	24	---	45	GND
4	---	25	Data1+(B)	46	---
5	---	26	Data1-(A)	47	---
6	Data2+(B)	27	---	48	---
7	Data2-(A)	28	---	49	---
8	---	29	---	50	GND
9	---	30	Data3+(B)	51	---
10	---	31	Data3-(A)	52	---
11	---	32	GND	53	---
12	---	33	Data4+(B)	54	---
13	---	34	Data4-(A)	55	GND
14	Data5+(B)	35	---	56	---
15	Data5-(A)	36	---	57	---
16	---	37	---	58	GND
17	---	38	Data6+(B)	59	---
18	---	39	Data6-(A)	60	---
19	---	40	GND	61	---
20	---	41	Data7+(B)	62	---
21	---	42	Data7-(A)		

CP-138U-I

This board supports RS-422 and RS-485 (both 2 and 4-wire).

Model	Board Connector	Supported Accessories	Serial Connectors
CP-138U-I	DB78 (female)	CBL-M78M9x8-100	8×DB9 (male)
		CBL-M78M25x8-100	8×DB25 (male)

DB78 (Female): RS-422, RS-485 (4-wire)

Pin	Signal	Pin	Signal	Pin	Signal
1	GND7	27	RxD5-(A)	53	---
2	RxD7+(B)	28	---	54	---
3	---	29	RxD4-(A)	55	---
4	GND6	30	---	56	---
5	RxD6+(B)	31	---	57	---
6	GND5	32	RxD3-(A)	58	---
7	RxD5+(B)	33	---	59	---
8	---	34	RxD2-(A)	60	TxD7-(A)
9	GND4	35	---	61	TxD7+(B)
10	RxD4+(B)	36	---	62	TxD6-(A)
11	GND3	37	RxD1-(A)	63	TxD6+(B)
12	RxD3+(B)	38	---	64	---
13	---	39	RxD0-(A)	65	TxD5-(A)
14	GND2	40	---	66	TxD5+(B)
15	RxD2+(B)	41	---	67	TxD4-(A)
16	GND1	42	---	68	TxD4+(B)
17	RxD1+(B)	43	---	69	---
18	---	44	---	70	TxD3-(A)
19	GND0	45	---	71	TxD3+(B)
20	RxD0+(B)	46	---	72	TxD2-(A)
21	---	47	---	73	TxD2+(B)
22	RxD7-(A)	48	---	74	---
23	---	49	---	75	TxD1-(A)
24	RxD6-(A)	50	---	76	TxD1+(B)
25	---	51	---	77	TxD0-(A)
26	---	52	---	78	TxD0+(B)

DB78 (Female): RS-485 (2-wire)

Pin	Signal	Pin	Signal	Pin	Signal
1	GND7	15	Data2+(B)	29	Data4-(A)
2	Data7+(B)	16	GND1	30	---
3	---	17	Data1+(B)	31	---
4	GND6	18	---	32	Data3-(A)
5	Data6+(B)	19	GND0	33	---
6	GND5	20	Data0+(B)	34	Data2-(A)
7	Data5+(B)	21	---	35	---
8	---	22	Data7-(A)	36	---
9	GND4	23	---	37	Data1-(A)
10	Data4+(B)	24	Data6-(A)	38	---
11	GND3	25	---	39	Data0-(A)
12	Data3+(B)	26	---	40	---
13	---	27	Data5-(A)	41	---

Pin	Signal	Pin	Signal	Pin	Signal
14	GND2	28	---	42	---

CP-168U

This board supports RS-232. With the OPT8F or OPT8Z accessory, it can support RS-422. With the OPT8K or OPT8I accessory, it can support RS-422 and RS-485 (both 2 and 4-wire).

Model	Board Connector	Supported Accessories	Serial Connectors
CP-168U	DB62 (Female)	OPT8-M9 CBL-M62M9x8-100 (OPT8D)	8×DB9 (Male)
		OPT8B CBL-M62M25x8-100 (OPT8C)	8×DB25 (Male)
		OPT8A, OPT8S, OPT8F, OPT8Z, OPT8K, OPT8I	8×DB25 (Female)
		OPT8-RJ45	8×RJ45

DB62 (Female): RS-232

Pin	Signal	Pin	Signal	Pin	Signal
1	TxD0	22	RxD0	43	CTS0
2	DTR0	23	DSR0	44	RTS0
3	RxD1	24	DCD0	45	GND
4	DSR1	25	TxD1	46	CTS1
5	DCD1	26	DTR1	47	RTS1
6	TxD2	27	RxD2	48	CTS2
7	DTR2	28	DSR2	49	RTS2
8	RxD3	29	DCD2	50	GND
9	DSR3	30	TxD3	51	CTS3
10	DCD3	31	DTR3	52	RTS3
11	RxD4	32	GND	53	CTS4
12	DSR4	33	TxD4	54	RTS4
13	DCD4	34	DTR4	55	GND
14	TxD5	35	RxD5	56	CTS5
15	DTR5	36	DSR5	57	RTS5
16	RxD6	37	DCD5	58	GND
17	DSR6	38	TxD6	59	CTS6
18	DCD6	39	DTR6	60	RTS6
19	RxD7	40	GND	61	CTS7
20	DSR7	41	TxD7	62	RTS7
21	DCD7	42	DTR7		

POS-104UL

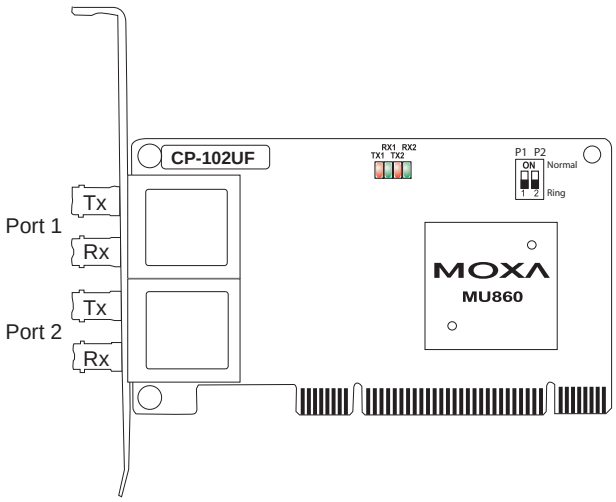
This board supports RS-232 only.

Model	Board Connector	Supported Accessories	Serial Connectors
POS-104UL	DB44 (female)	CBL-M44M9x4-50(POS)	4×DB9 (male)

DB44 (Female): RS-232

Pin	Signal	Pin	Signal	Pin	Signal
1	TxD3	16	CTS3	31	DCD3
2	RxD3	17	DTR3	32	---
3	RTS3	18	DSR3	33	GND
4	5V/12V/RI3	19	---	34	---
5	TxD2	20	CTS2	35	DCD2
6	RxD2	21	DTR2	36	---
7	RTS2	22	DSR2	37	GND
8	5V/12V/RI2	23	---	38	---
9	TxD1	24	CTS1	39	DCD1
10	RxD1	25	DTR1	40	---
11	RTS1	26	DSR1	41	GND
12	5V/12V/RI1	27	---	42	DCD0
13	TxD0	28	CTS0	43	5V/12V/RI0
14	RxD0	29	DTR0	44	GND
15	RTS0	30	DSR0		

CP-102UF



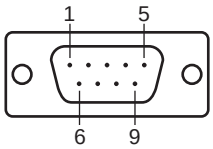
Serial Connectors

DB9 (Male)

The following accessories provide DB9 (male) serial connectors for your UPCI board:

Accessory	Board Connector	Serial Connectors
CBL-M25M9x2-50	DB25 (female)	2×DB9 (male)

Accessory	Board Connector	Serial Connectors
CBL-M44M9x4-50	DB44 (female)	4×DB9 (male)
CBL-M44M9x4-50(POS)	DB44 (female)	4×DB9 (male)
CBL-RJ45M9-150	RJ45	4×DB9 (male)
OPT8-M9 CBL-M62M9x8-100 (OPT8D)	DB62 (female)	8×DB9 (male)
CBL-M78M9x8-100	DB78 (female)	8×DB9 (male)



The pin assignments for the DB9 (male) serial connector are shown below. There are different pin assignments depending on the serial interface that your board is configured for.

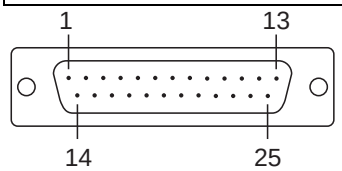
Pin	RS-232	RS-422 RS-485 (4W)	RS-485 (2W)
1	DCD	TxD-(A)	---
2	RxD	TxD+(B)	---
3	TxD	RxD+(B)	Data+(B)
4	DTR	RxD-(A)	Data-(A)
5	GND	GND	GND
6	DSR	---	---
7	RTS	---	---
8	CTS	---	---
9	*5V/12V/RI	---	---

* The 5V/12V/RI signal only applies to the POS-104UL

DB25 (Male)

The following accessories provide DB25 (male) serial connectors for your UPCI board:

Accessory	Board Connector	Serial Connectors
CBL-M44M25x4-50	DB44 (female)	4×DB25 (male)
CBL-RJ45M25-150	RJ45	4×DB25 (male)
OPT8B CBL-M62M25x8-100 (OPT8C)	DB62 (female)	8×DB25 (male)
CBL-M78M25x8-100	DB78 (female)	8×DB25 (male)



The pin assignments for the DB25 (male) serial connector are shown below. There are different pin assignments depending on the serial interface that your board is configured for.

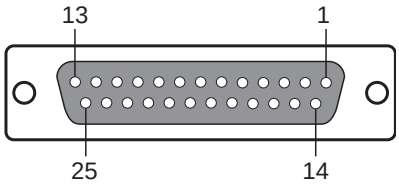
Pin	RS-232	RS-422 RS-485 (4W)	RS-485 (2W)
2	TxD	RxD+(B)	Data+(B)
3	RxD	TxD+(B)	---
4	RTS	---	---
5	CTS	---	---
6	DSR	---	---
7	GND	GND	GND
8	DCD	TxD-(A)	---
20	DTR	RxD-(A)	Data-(A)

DB25 (Female)

The following accessories provide DB25 (female) serial connectors for your UPCI board:

Accessory	Board Connector	Serial Connectors
OPT8A, OPT8S, *OPT8F, *OPT8Z, *OPT8K, *OPT8I	DB62 (female)	8×DB25 (female)

* The OPT8F, OPT8Z, OPT8K, and OPT8I are designed for use with the CP-168U only.



The pin assignments for the DB25 (female) serial connector are shown below. There are different pin assignments depending on the serial interface that your board is configured for.

OPT8A, OPT8S

Pin	RS-232	RS-422 RS-485 (4W)	RS-485 (2W)
2	RxD	TxD+(B)	---
3	TxD	RxD+(B)	Data+(B)
4	CTS	---	---
5	RTS	---	---
6	DTR	RxD-(A)	Data-(A)
7	GND	GND	GND
8	DCD	TxD-(A)	---
20	DSR	---	---

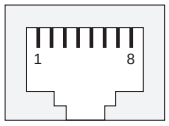
OPT8F, OPT8Z, OPT8K, OPT8I

Pin	RS-422 RS-485 (4W)	RS-485 (2W)
2	RxD+(B)	Data+(B)
3	TxD+(B)	---
7	GND	GND
14	RxD-(A)	Data-(A)
16	TxD-(A)	---

RJ45

The following accessories provide RJ45 serial connectors for your UPCI board:

Accessory	Board Connector	Serial Connectors
OPT8-RJ45	DB62 (female)	8×RJ45



The pin assignments for the RJ45 serial connector are shown below. Only RS-232 is supported. The OPT8-RJ45 accessory should only be used with the CP-118U in RS-232 mode or with the CP-168U.

Pin	RS-232
1	DSR
2	RTS
3	GND
4	TxD
5	RxD
6	DCD
7	CTS
8	DTR